

Product specification

Universal oven

Model UFE 500



Standard equipment

Ventilation and Control

- forced air circulation by quiet air turbine, adjustable in 10% steps via process controller
- continuous adjustment of pre-heated fresh air admixture
- vent connection with restrictor flap
- fuzzy-supported PID microprocessor controller with integrated autodiagnostic system with fault indication
- solid state switching unit
- 2 Pt100 sensors Class A in 4-wire-circuit, mutually monitoring and taking over the performance at the same temperature value
- digital 7-day-programme-timer with real time clock, precise minute setting, for one set value or ramp operation in combination with:
- integrated digital timer for tempering profile with max. 4 segments, each segment adjustable from 1 min to 999 hours:
DELAYED ON
HEATING UP
HOLD or HOLD set-temperature-dependent with guaranteed holding time
COOLING DOWN
- "Loop" function to repeat profile 1-99 times or endless
- digital display (LED) of all set parameters, such as temperature, weekdays, time, fan speed, ramp segments and set-up values
- resolution of display for set value 0,5 °C; for actual value 0,1 °C below 99,9 °C, 0,5 °C above 100 °C
- long-term logging (ring store) of all relevant data, GLP-conforming as data logger - 1024 kB
- serial interface RS 232 including MEMMERT Software „Celsius 2007" for programming and documentation

- incl. works calibration certificate for +160 °C

Triple Overtemperature Protection

- in case of overtemperature due to failure, the heating is switched off at approx. 10 °C above the set temperature (fixed value)
- independently working, digitally adjustable electronic overtemperature controller TWW protection class 3.1
- resolution of display and setting accuracy: 0,5 °C below 99,9 °C, 1 °C above 100 °C
- mechanical temperature limiter TB protection class 1 switching the heating off at approx. 10 °C above max. oven temperature

Textured Stainless Steel Casing

- w x h x d: 710 x 760 x 550 mm
- fully insulated stainless steel door with double locking and 4-point adjustment
- rear zinc-plated steel

Interior - Heating Concept

- w x h x d: 560 x 480 x 400 mm, 108 l
- easy-to-clean interior, made of stainless steel, reinforced by deep drawn ribbing with integrated and protected large-area heating on four sides
- 2 perforated stainless steel shelves, non-tipping

Temperature Range

- from +30 °C (however, at least 10 °C above ambient) up to +250 °C

Voltage / Power Rating

- 230 V (+/- 10%), 50/60 Hz
- ca. 2.000 W (during heating)

- adaption of effective heating power depending on the set temperature

Packing Data

- net weight approx. 56 kg
- gross weight carton approx. 69 kg
- gross weight wooden case approx. 81 kg
- dimensions approx.:
carton w x h x d: 82 x 97 x 67 cm
wooden case w x h x d: 87 x 96 x 66 cm
- the appliances must be transported upright

Customs Tariff Number

- 8419 3990

Country of Origin

- Federal Republic of Germany

WEEE-Reg.-No.

- DE 66812464

Accessories

- | | |
|---|-------|
| • Temperature range +300 °C for universal ovens (not available for ovens with glass door) | A0 |
| • Perforated stainless steel shelf, non-tipping | E0(x) |
| • IQ check list with works test data for oven as support for validation by customer | Q1 |
| • OQ check list including one free-selectable temperature distribution survey to DIN 12880 for 9 measuring points with works test data for oven as support for validation by customer | Q2 |

memmert

EXCELLENT



Universal oven
UNE 200-800
UFE 400-800

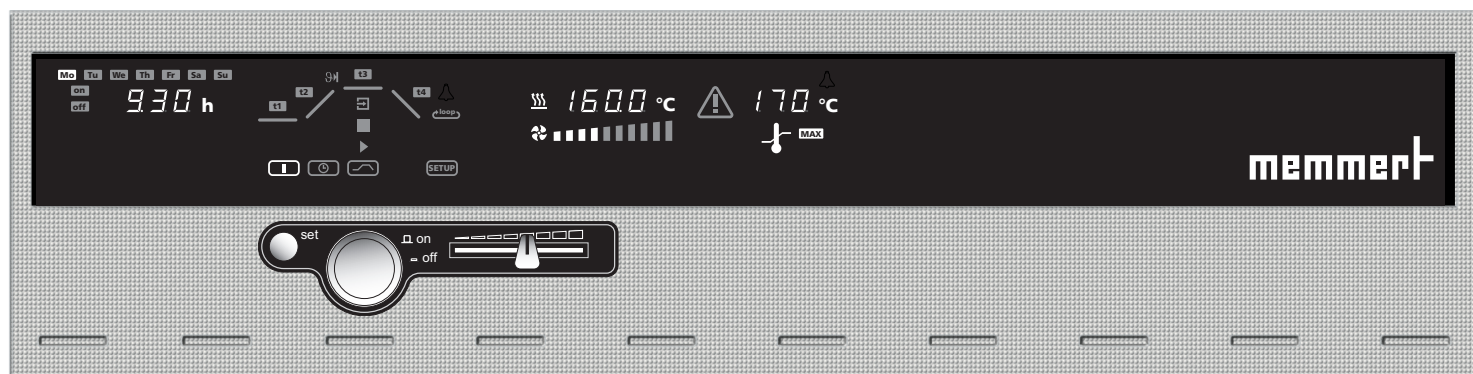


Steriliser
SNE 200-400
SFE 400-800



Incubator
INE 200-800

Operating Instructions



1.	Contents	2
2.	General notes and safety notes	4
2.1	Intended purpose when used as medical product	4
2.2	Transport	4
2.3	Initial start-up	5
2.4	Oven load	5
3.	Technical data	6
3.1	Standard equipment of EXCELLENT ovens	7
3.2	Material quality	7
3.3	Electrical equipment	8
3.4	External connection	8
4.	Installation facilities (accessories)	9
4.1	Subframe	9
4.2	Wall bracket	9
4.3	Stackable version	9
5.	Oven construction and operation	10
5.1	Operating the door	10
5.2	Controls and indications	11
5.3	Switching on	11
5.4	Setting air changes	11
5.5	Setting the temperature	11
6.	Selecting the operating mode	12
7.	Setting the parameters	12
8.	Normal operation 	13
9.	Weekly programmer 	15
10.	Ramp timer 	17
11.	Basic oven settings 	23
11.1	Real-time clock	23
12.	Temperature monitor and protection devices	24
12.1	Mechanical temperature monitor: temperature limiter (TB)	24
12.2	Electronic temperature monitor	24
13.	Calibration	26
14.	Communication interface RS232C for the PC	28
15.	Report memory	29
15.1	Reading the report memory into the PC via RS232C	29
16.	Sterilisers	30
16.1	Guidelines for sterilisation in MEMMERT hot air sterilisers	30
16.2	Steriliser cassettes	34
17.	Cleaning	35
18.	Maintenance	35
19.	Error messages	36
20.	Supply failure	36
21.	CE Conformity Declaration	37
22.	Address	40
23.	Index	41

2. General notes and safety notes

You have purchased a technically fully proven product which has been produced in Germany with the use of high-grade materials and the application of the latest manufacturing techniques; it has been factory tested for many hours.

In addition we guarantee the supply of spare parts over 10 years.



This mark in the Operating Instructions means:

Watch out
Important Note



This mark on the product means:

Note Operating Instructions
Warning – oven hot when operating



Observation of the Operating Instructions is necessary for faultless operation and for any possible claims under warranty. If these Instructions are disregarded, all claims under warranty, guarantee and indemnification are excluded.

The right to technical modifications is reserved.
Dimensional details are not binding.

2.1 Intended purpose when used as medical product

For ovens covered by the scope of the Directive 93/42/EEG (Directive of the Commission on the harmonization of the legal regulations of the Member States on medical devices) the following intended purpose applies:

For ovens series INE / UNE / UFE:

The product is intended for heating non-sterile cloths, sheets and blankets.

For ovens series SNE / SFE:

The product is intended for the sterilisation of medical products with dry heat using hot air at atmospheric pressure.

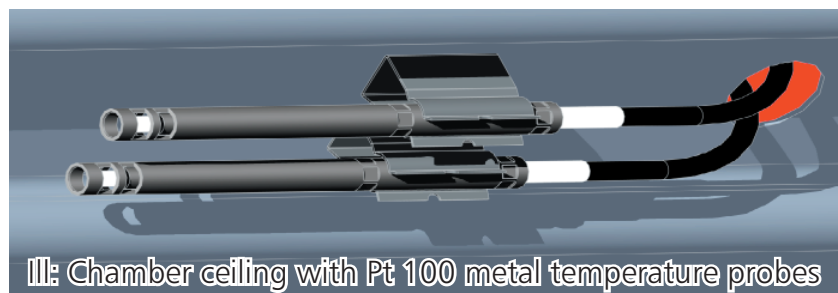
2.2 Transport

Always use gloves!

If the oven has to be carried, at least 2 persons are required to transport it.

2.3 Initial start-up

When the oven is started up for the first time, it should be supervised continuously until steady conditions have been reached. Severe vibrations during transport may cause movement of the temperature probes in their holder inside the chamber. Note therefore that before the first start-up the temperature probes should be checked for their correct position and, if necessary, carefully aligned in their mounting (see ill).



2.4 Oven load

Full consideration must be given to the physical and chemical properties of your load (e.g. combustion temperature etc.) in order to prevent serious damage to load, oven and surroundings.

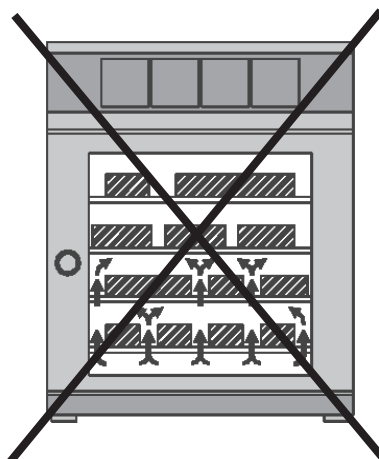
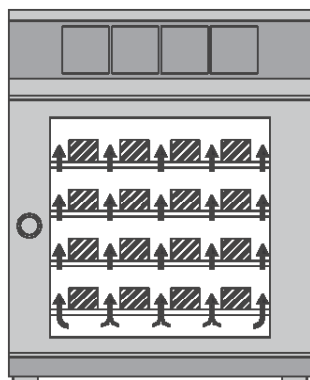
Please note that the Memmert ovens described here are not explosionproof (they do not conform to the Industrial Association Specification VBG 24) and are therefore not suitable for drying, evaporating and burning-in of paints, enamels or similar materials whose solvents may produce an inflammable mixture with air. There must be no possibility of the formation of inflammable gas/air mixtures either within the oven chamber or in the immediate surroundings of the equipment.

Large amounts of dust or corrosive fumes inside the oven chamber or in the surroundings of the equipment may produce deposits within the oven and lead to short-circuits or damage the electronics. It is therefore important that adequate precautions are taken against excessive dust or corrosive fumes.

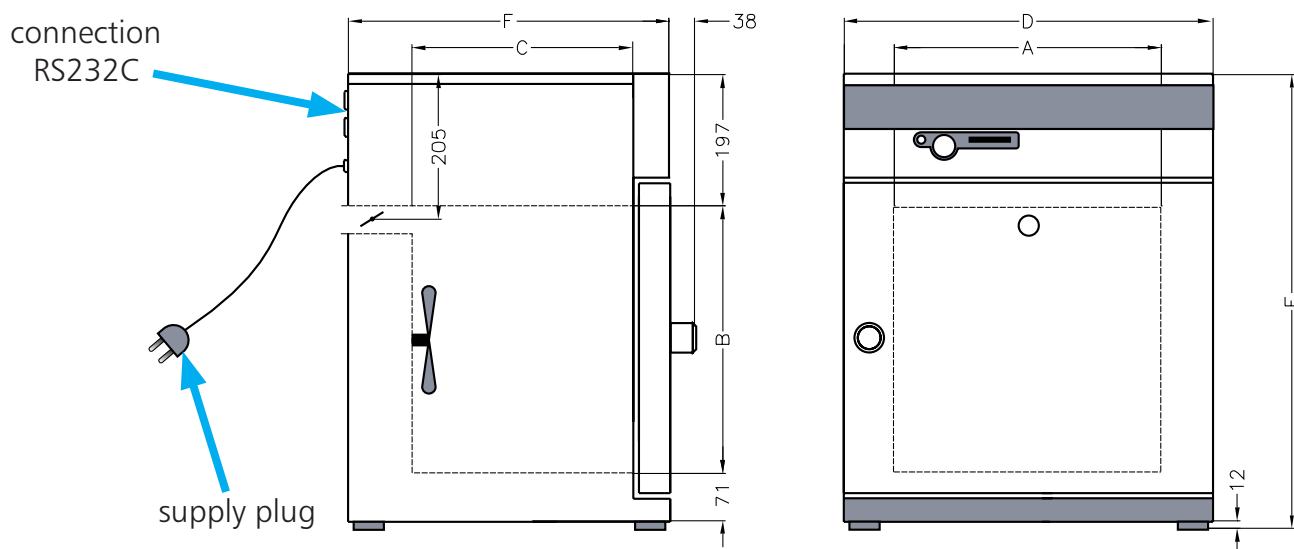
In order to ensure proper air circulation inside the chamber, there must be sufficient spacing of the load inside the oven. Do not place any load on the floor, against the side walls or underneath the ceiling of the chamber (heating ribs). In order to ensure optimum air circulation the shelves must be so inserted that the air spacings between door, shelf and rear chamber wall are approximately equal.

The maximum number and the loading of the shelves can be found in the [table in the Section "Technical Data"](#). With unfavourable loading (too closely spaced) and completely opened ventilation it is possible that the set temperature may be reached only after a longer period of time.

See stick-on label "Correct Loading" on the oven!



3. Technical data



Model	200	300	400	500	600	700	800
Chamber width A [mm]	400	480	400	560	800	1040	1040
Chamber height B [mm]	320	320	400	480	640	800	1200
Chamber depth C [mm]	250	250	330	400	500	500	600
Oven width D [mm]	550	630	550	710	950	1190	1190
Oven height E [mm]	600	600	680	760	920	1080	1605
Oven depth F [mm]	400	400	480	550	650	650	750
Chamber volume [Liter]	32	39	53	108	256	416	749
Weight [kg]	28	30	35	50	87	121	170
Power, ovens UNE/UFE/SNE/SFE [W]	1100	1200	1400	2000	2400	4000	4800
Power, ovens INE [W]	440	500	800	900	1600	1800	2000
Max. number of shelves	3	3	4	5	7	8	10
Max. load per shelf [kg]	15	12	30	30	30	30	30
Total load per oven [kg]	30	30	90	60	80	100	160
Ambient conditions	Ambient temperature 5°C to 40°C rH 80% max., no condensation Overvoltage category: II Contamination level: 2						
Setpoint temperature range	20°C to nominal temperature (details see label)						
Setting accuracy:	INE: 0.1°C UNE/UFE/SNE/SFE: 0.5°C						
Working temperature range	From 5°C above ambient temperature up to nominal temperature = maximum temperature (details see label) With fan switched on (UFE/SFE) from 10°C above ambient temperature up to nominal temperature = maximum temperature (details see label)						

3.1 Standard equipment of EXCELLENT ovens

- Electronic fuzzy-supported PID process controller with delayed programme start, programmable heating and cooling ramp, setpoint-dependent waiting time and repeat function . The controller has permanent power matching and an auto-diagnostic system for rapid fault finding (see Section: "Error messages")
- Internal report memory 1024kB for storing actual temperature, setpoint temperature and error states with time stamp
- Fan with speed adjustment on recirculation ovens (adjustment in 10% steps)
- Manually adjustable air valve for recirculation or fresh air operation
- Integral weekly programmer with group function (e.g. all workdays)
- Recessing push/turn control for simple operation of oven
- Visual alarm indication
- Digital overtemperature monitor (TWW Class 3.1)
- Mechanical temperature limiter (TB Class 1)
- Monitor relay to switch off heating in case of fault
- Two separate PT100 temperature sensors Class A in 4-wire circuit for control and monitoring
- Convenient 3-point temperature calibration
- Temperature-dependent ventilation of control panel and door
- Serial RS232C interface for computer-supported temperature programmes and for reading the internal report memory
- MEMMERT software "Celsius 2005" for remote operation of oven via a PC
- Special equipment (to be ordered separately as accessories): adjustable temperature limiter (TWB), subframe, wall bracket, wire shelf, sterilisation cassette, cable RS232C to DIN 12 900-1

3.2 Material quality

For external casing and working chamber MEMERT are using stainless steel (Mat.Ref. 1.4301) which features high strength, optimum hygienic properties and corrosion resistance against many (not all) chemicals (warning against e.g. chlorine compounds).

The oven load has to be checked carefully for its chemical compatibility with the above materials. A compatibility table covering all these materials can be requested from MEMMERT.



Do not place the oven on a readily inflammable support surface!



WARNING! Always pull out the supply plug
before opening the oven cover!

3.3 Electrical equipment

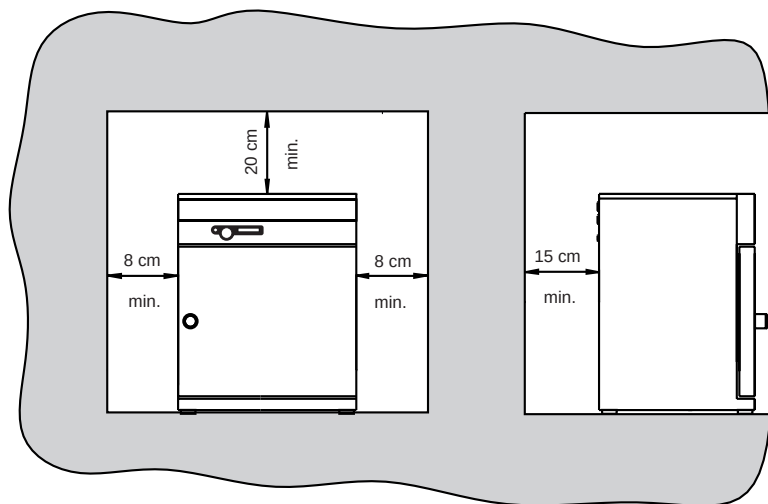
- Operating voltage see label 50/60 Hz
- Current rating see label
- Protection Class 1, i.e. operating isolation with ground connection to EN 61 010
- Protection IP20 to EN 60 529
- Interference suppression to EN55011 Class B
- Oven protected by a fuse 250V/15A fast blow
- Controller protected by a 100 mA fuse (200 mA on 115 V)
- When connecting a MEMMERT oven to the electrical supply you have to observe any local regulations which apply (e.g. in Germany DIN VDE 0100 with FI protection circuit)

This product is intended to operate on a supply network with a system impedance Z_{max} at the transfer point (building connection) of 0.292 Ohm max. The user has to ensure that the product is only operated on an electrical supply network which meets these requirements. If necessary, details of the system impedance can be obtained from the local electricity supply authority.

3.4 External connection

Equipment connected to the external connections must have interfaces which meet the requirements for safe low voltage (e.g. PC).

4. Installation facilities (accessories)



The oven can be placed on the floor or on a bench (working surface). It is important that the oven is set up accurately horizontally; the door may have to be adjusted (see [Section: "Maintenance"](#))

The spacing from the back of the oven to the wall should be at least 15 cm. The spacing to the ceiling must not be less than 20 cm and that at the side to the wall not less than 8 cm. Generally it is essential to have adequate air ventilation around the oven.

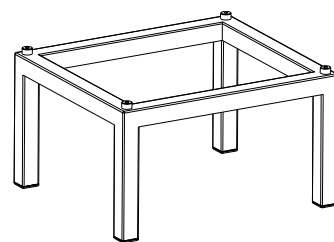
Model 800 is mounted on castors. The front castors pivot and can be locked. In order to ensure the stability of the oven the front castors must always be set facing towards the front.

Information on accessories will be found in our leaflet or on our internet page www.memmert.com.

Please note the installation instructions for our accessories.

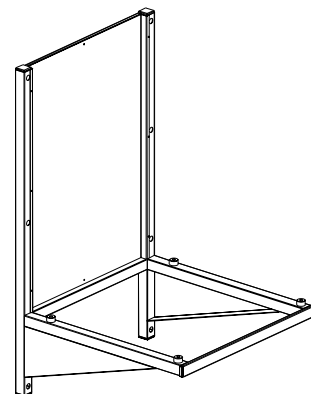
4.1 Subframe

Oven models 500 to 700 can be mounted on a subframe (accessory)



4.2 Wall bracket

Oven models 200 to 700 can be wall-mounted using the wall bracket (accessory). The wall bracket is factory-fitted with a fire-resistant plate. The size and length of the screws used and of the corresponding dowel plugs depend on the total weight (oven plus load) and vary with the condition of the wall.

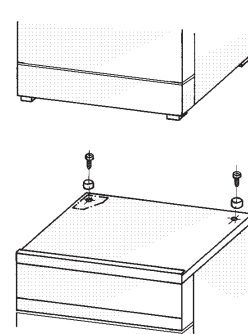


4.3 Stackable version

Two ovens of the same model size can be stacked on each other. Note that the oven with the lower working temperature must always be placed at the bottom.

Foot locators (accessory) have to be fitted on the bottom oven. (Model 700 can only be stacked using an intermediate frame.)

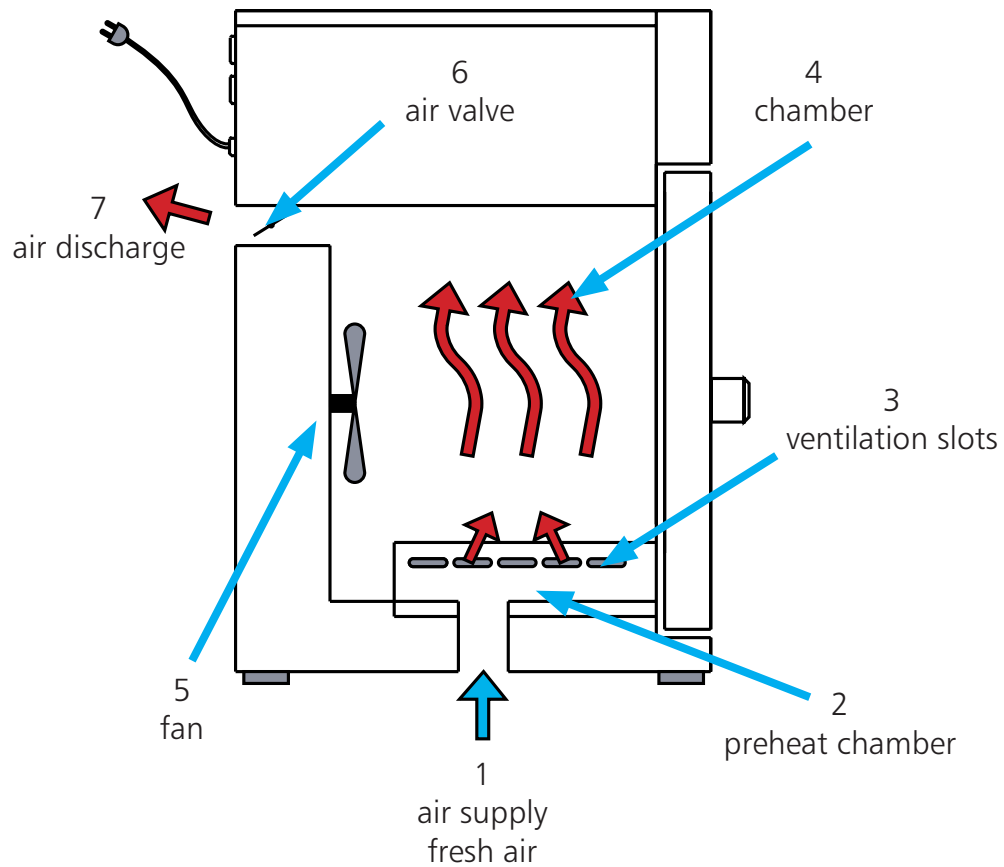
- Take off cover of bottom oven
- Place drill jig (supplied with foot locators) into the inverted cover at the back
- Mark holes and drill 4.2 mm dia.
- Screw the foot locators to the top of the cover using the screws and nuts supplied
- Re-fit the cover



5. Oven construction and operation

Ovens Series UNE, INE and SNE have natural ventilation.

In Series UFE and SFE ovens, air circulation is provided by a fan on the back wall of the chamber.

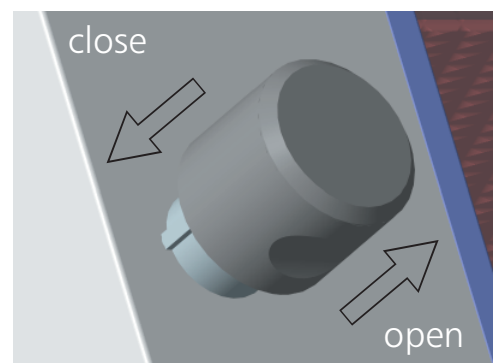


The incoming air (1) is warmed in a preheat chamber (2) in both convection and fan-circulation ovens. The preheated air enters the chamber (4) through ventilation slots (3) in the chamber side wall. The fan (5) on the chamber back wall produces a larger air throughput and a more intensive horizontal forced circulation compared with natural convection. The air valve (6) on the back of the oven controls the rate of air intake and discharge (air change) (7).

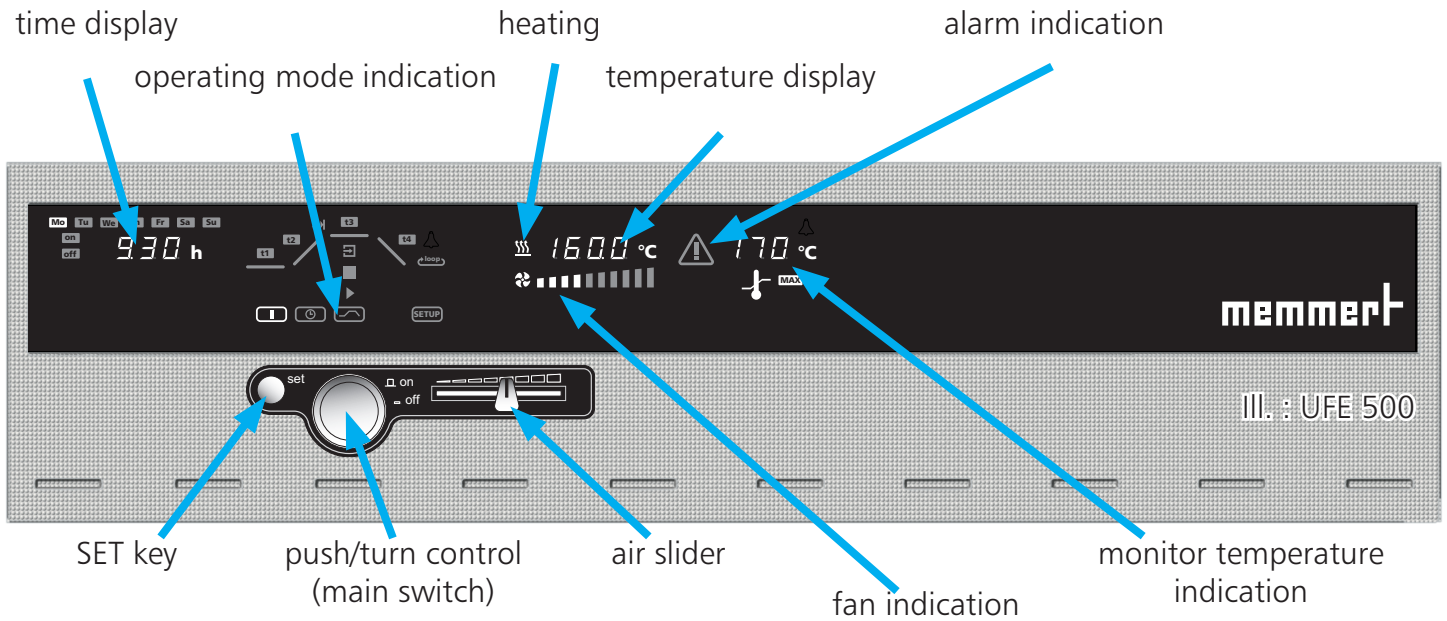
5.1 Operating the door

The door is opened by pulling on the door handle.

The door is closed by the door handle being pushed in.

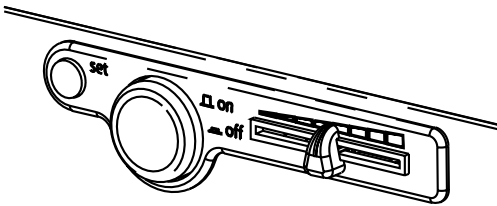


5.2 Controls and indications

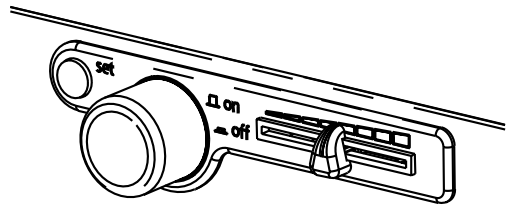


5.3 Switching on

The oven is switched on by pressing the push/turn control.



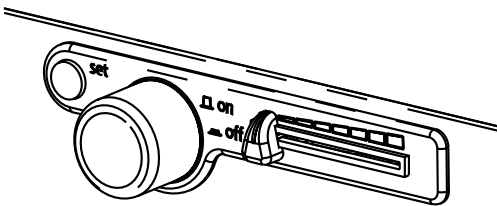
Oven switched off. The push/turn control is pushed in and protected against damage



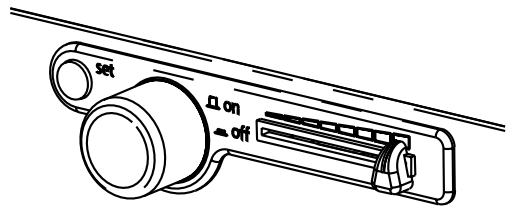
Oven switched on and can be operated using the push/turn control and the SET key.

5.4 Setting air changes

Moving the air slider opens and closes the air valve to control the supply and discharge of air.



Air valve closed



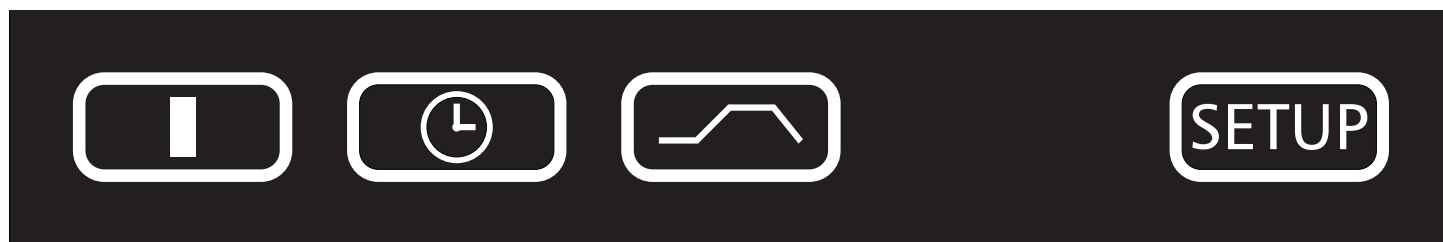
Air valve fully open

5.5 Setting the temperature

Hold down the SET key and set the temperature setpoint with the push/turn control.

After the SET key has been released the display briefly flashes the temperature setpoint. The display then changes to the actual current temperature and the controller starts to control to the selected temperature setpoint.

6. Selecting the operating mode



Normal operation

Weekly
programmer

Ramp timer
Programme
operation

Basic settings

After holding down the SET key (approx. 3 sec), the current operating mode flashes on the display. A different operating mode can be selected with the push/turn control while the SET key is being held down. After the SET key has been released the controller operates in the new operating mode.

7. Setting the parameters

After an operating mode has been selected, all relevant controller settings are shown simultaneously on the display.

A parameter (menu item) can be selected by rotating the push/turn control; all other parameters are then dimmed.

The selected parameter flashes brightly and can now be altered with the push/turn control while holding down the SET key.

After the SET key has been released the newly set value is stored.

If the push/turn control or the SET key have not been operated for a period of 30 seconds, the controller automatically returns to the main menu.

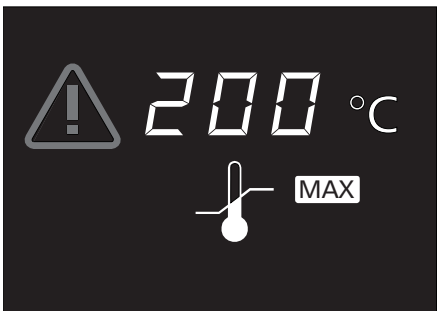
8. Normal operation



In this operating mode the oven operates continuously. The settings for operating the oven can be selected. The settings act directly on the operation of the oven.

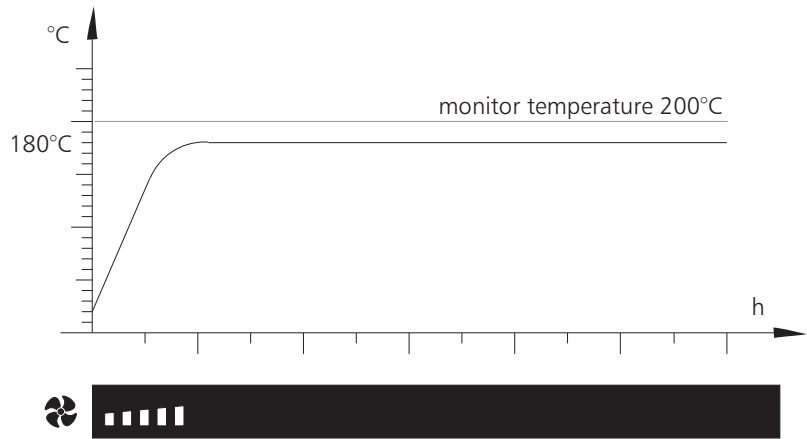


By rotating the push/turn control the following parameters can be selected and can be altered as described in the Section “Setting the parameters”:

Temperature setpoint Range: 20°C up to nominal temperature (details see label)	
Fan speed Range: 0 to 100% in 10% steps	
Temperature monitor Range: up to 10°C above nominal temperature (details see label). (see Section: “Temperature monitor”)	

Setting example "Normal operation"

The oven (UFE500) has to heat up to 180°C at a fan speed of 50%. The overtemperature monitor has to operate at 200°C.



1. Select operating mode "Normal operation"

After holding down the SET key (approx. 3 sec), the current operating mode is flashing. Select operating mode I with the push/turn control while holding down the SET key. After the SET key has been released the controller is in operating mode I.



2. Select temperature setpoint

Hold down the SET key and use the push/turn control to select the required temperature setpoint of 180°C. After the SET key has been released the oven briefly flashes the temperature setpoint. The display then changes to the actual temperature and the controller starts to control to the selected temperature setpoint of 180°C. Heating is indicated by the orange heater symbol.



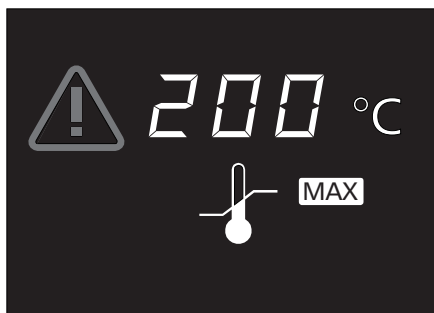
3. Select fan speed

Turn the push/turn control clockwise until the fan symbol is flashing. While holding down the SET key, use the push/turn control to set 50% fan speed.



4. Select monitor temperature

Turn the push/turn control clockwise until the monitor temperature display is flashing. Hold down the SET key and use the push/turn control to set the monitor temperature to 200°C.



9. Weekly programmer



In this operating mode the weekly programmer is activated and the oven switches on and off automatically at the programmed times.

While the weekly programmer is in the OFF phase the oven is in standby mode. Heating and fan are switched off, the controller display is dimmed and shows the clock time.

The sequence of the weekly programmer is repeated every week.

A maximum of 9 time blocks, each consisting of ON time and OFF time, can be programmed. Clockwise rotation of the push/turn control is used to select the temperature setpoint (etc.) to which the oven has to control during the ON phase. If no settings are made the controller takes the values from operating mode I.

By clockwise rotation of the push/turn control the parameters can be selected as in operating mode I, and altered as described in [Section "Setting the parameters"](#).



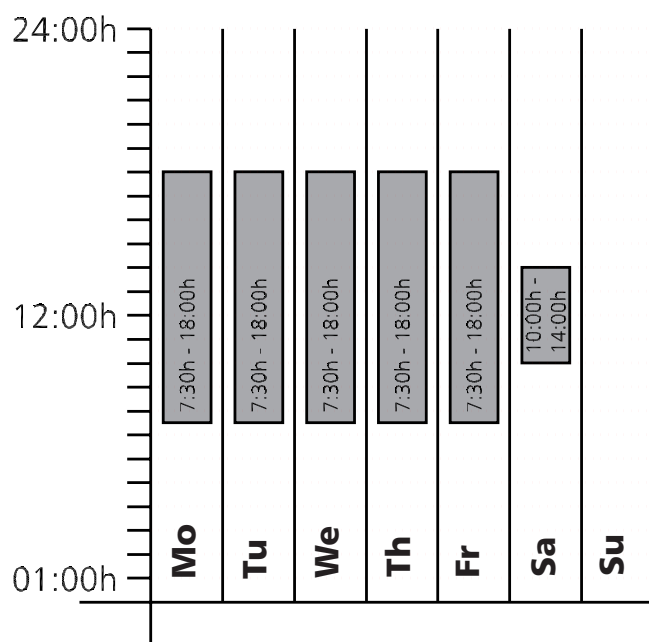
The time blocks are selected by rotating the push/turn control anticlockwise. The switching times can be altered while holding down the SET key.

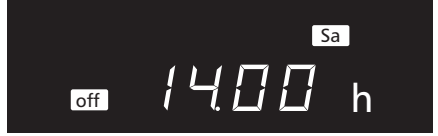
<u>Weekday</u> Range: Monday to Sunday	
<u>Day groups</u> Range: workday Mo-Fr weekend Sa-Su	 
<u>No ON time: ----</u> On these days the oven is not switched on	
<u>ON time</u> Range: 00:00 to 23:59 hrs.	
<u>OFF time</u> Range: one minute above ON time to 24:00	

For safety reasons, always check that an ON time has been programmed only during the required time blocks and days.

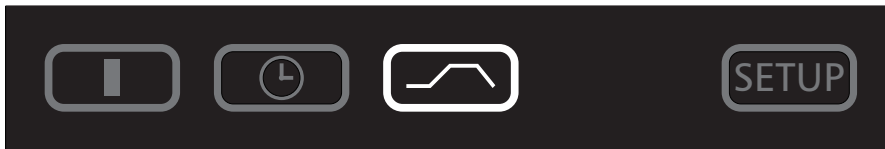
Setting example "Weekly programmer"

The oven (UFE500) has to switch on at 07.30 hrs from Mo to Fr (workday group) and switch off at 18.00 hrs. In addition it has to operate on Saturday from 10.00 to 14.00 hrs.

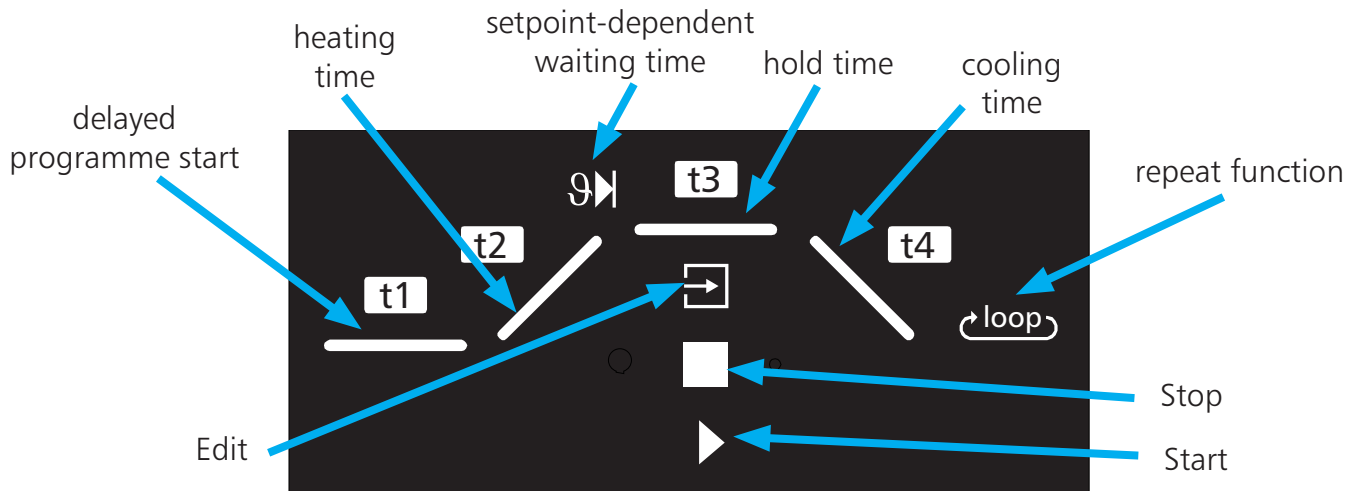


1. Select operating mode "Weekly programmer" After holding down the SET key (approx. 3 sec) the current operating mode is flashing. Select operating mode "Weekly programmer" with the push/turn control while holding down the SET key. After the SET key has been released the controller is in operating mode "Weekly programmer".	
2. Switch on at 07.30 hrs Mo-Fr Turn the push/turn control anticlockwise to select the symbols "Mo-Fr on" (workday group). Hold down the SET key and use the push/turn control to set the switch-on time to 7:30.	
3. Switch off at 18.00 hrs Mo-Fr Using the push/turn control select the symbols "Mo-Fr off" (workday group). Hold down the SET key and use the push/turn control to set the switch-off time to 18:00.	
4. Switch on at 10.00 hrs Sa Using the push/turn control select the symbols "Sa on". Hold down the SET key and use the push/turn control to set the switch-on time to 10:00.	
5. Switch off at 14.00 hrs Sa Using the push/turn control select the symbols "Sa off". Hold down the SET key and use the push/turn control to set the switch-off time to 14:00 hrs.	

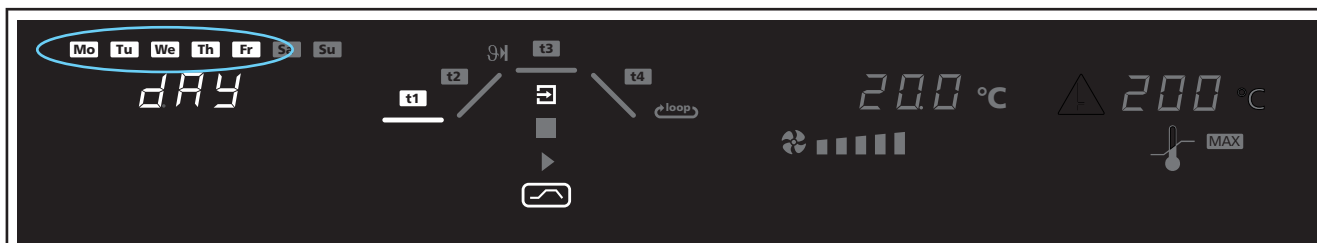
10. Ramp timer



In this operating mode a fixed ramp sequence is programmed. A time period can be input for each ramp segment, or the appropriate ramp segment can be de-activated by setting "---". After the end of the programme the oven switches off the heating and cools down to ambient temperature. In the case of ovens UFE and SFE the fan runs on for 30 minutes.



By turning the push/turn control the following parameters can be selected and can be altered as described in the Section ["Selecting the parameters"](#):



Delayed programme start **t1** : switch-on day

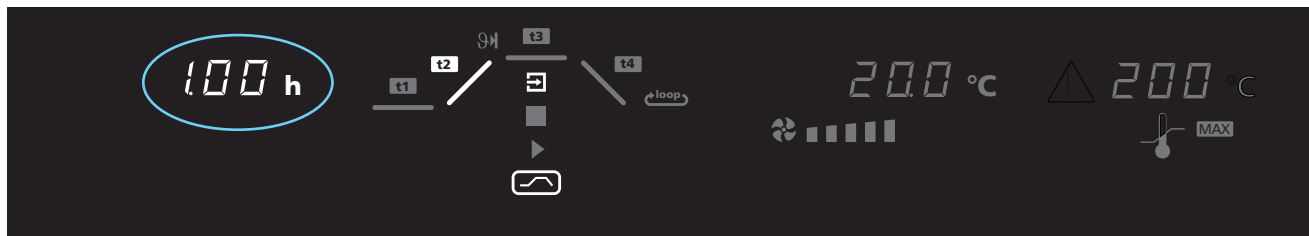
Range: Monday to Sunday, workdays Mo-Fr, weekend Sa-Sun, all days Mo-Su or no day. If no day of the week is selected, the oven starts up immediately after the programme is started.



Delayed programme start **t1** : switch-on time

Range: 00:00 to 23:59

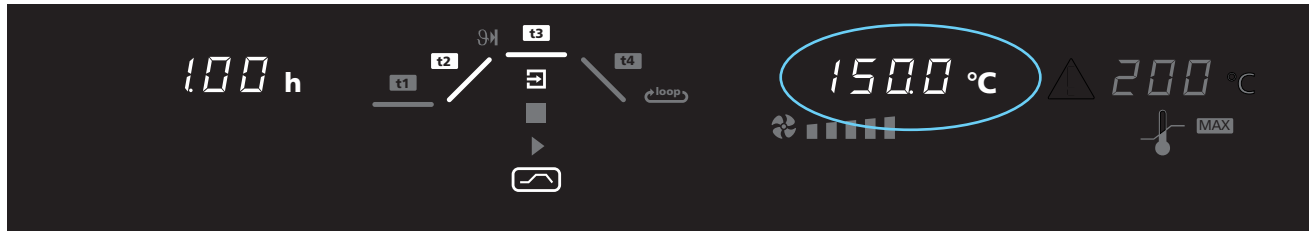
If no switch-on day has been selected it is not possible to select a switch-on time, and the programme starts immediately.



Heating time = heating up to setpoint temperature **t2**

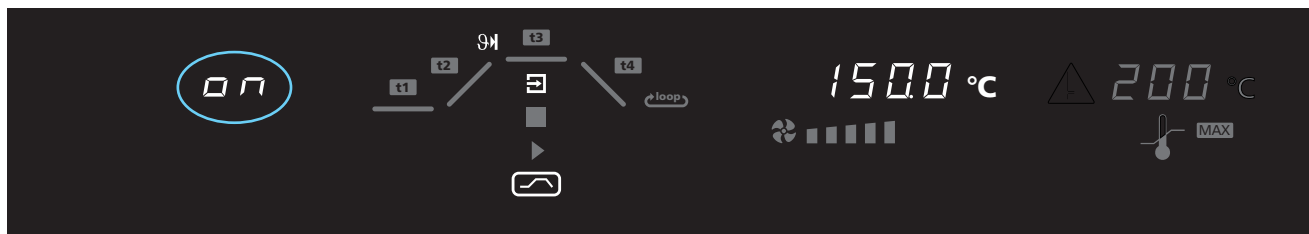
Range:

no heating time OFF or 1 minute to 999 hours



Setpoint temperature

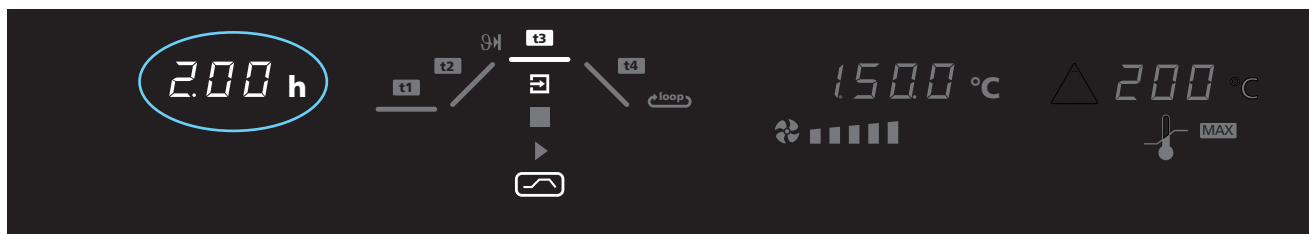
Range: 20°C to nominal temperature (details see label)



Setpoint-dependent waiting time **ON**

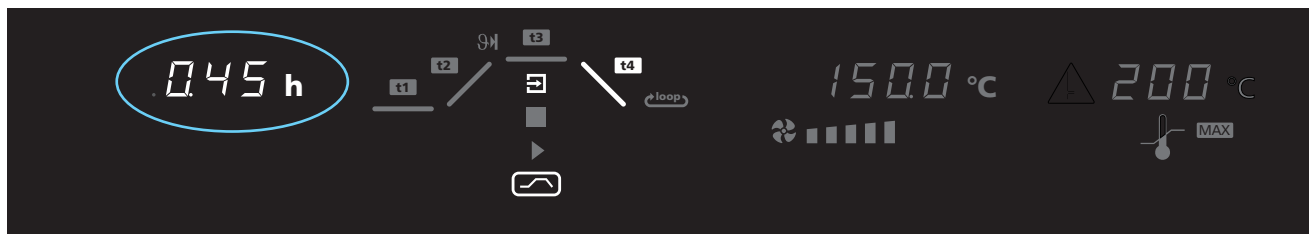
The oven starts the hold time t3 only when the selected setpoint temperature has been reached, even if this exceeds the time selected at t2 (see programming example)

Range: ON or OFF



Hold time = maintain setpoint temperature **t3**

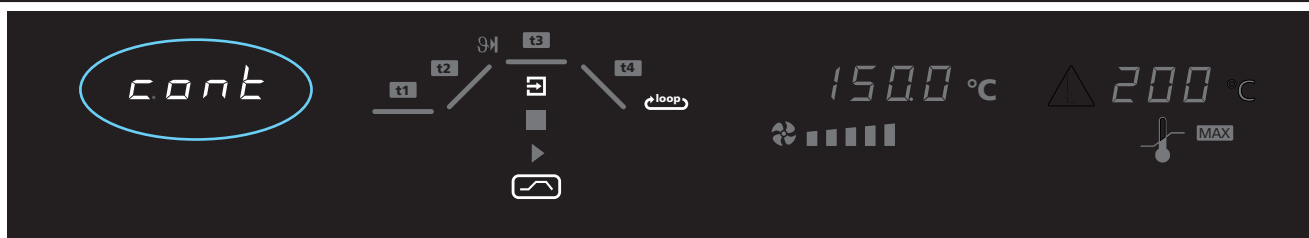
Range: from 1 minute to 999 hours or no hold time ----



Cooling time = cooling down to ambient temperature **t4**

Range: from 1 minuten to 999 hours or no cooling time ---

If no time is selected, the oven cools down naturally to ambient temperature



loop Number of ramp repeats

Range:

OFF = no repeat function

1-99 = number of repeats

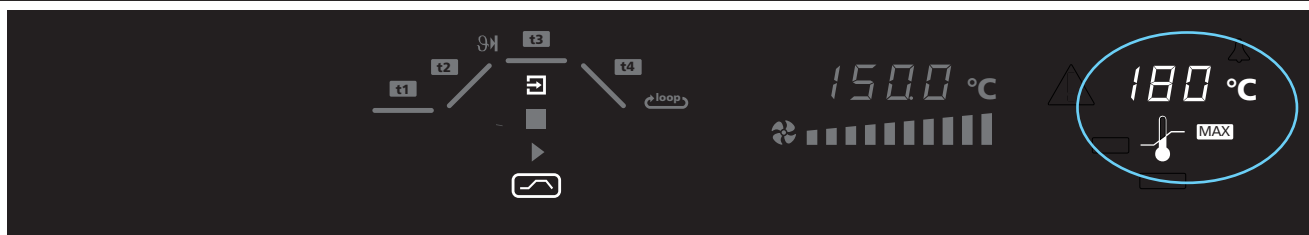
CONT = continuous repeat function



Fan speed (UFE/SFE only) 

Range:

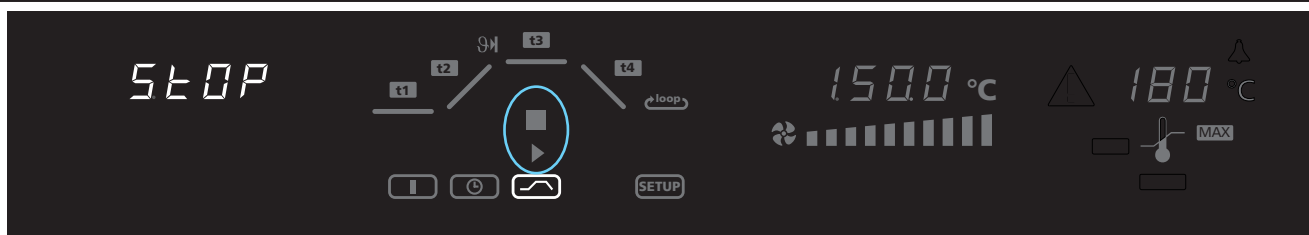
0 – 100% in 10% steps



Monitor temperature **MAX**

Range: up to 10°C above nominal temperature (details see label).

see Section: "Temperature monitor"



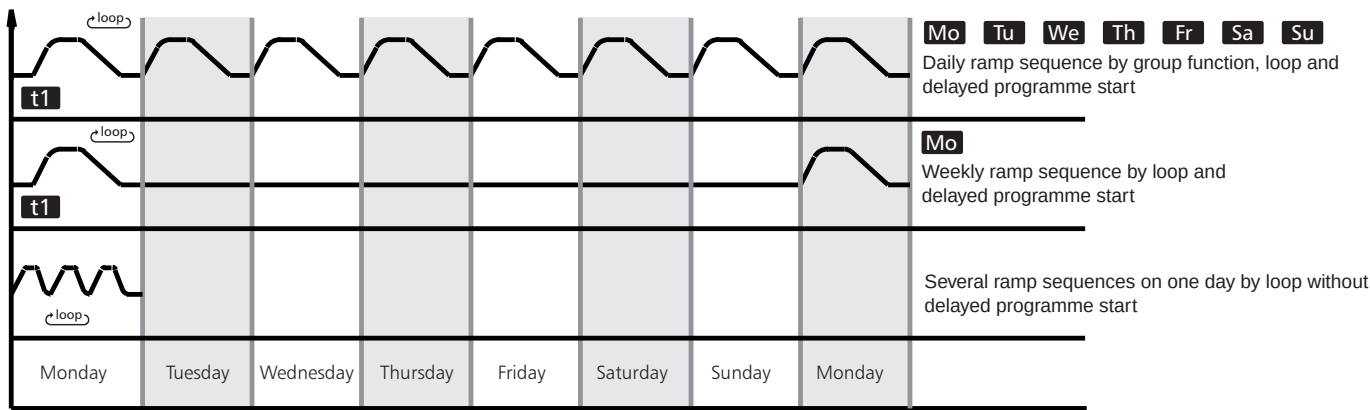
Start the programme

Turn push/turn control clockwise until the stop symbol  is flashing.

Hold down the SET key and with the push/turn control select start  anwählen.

Programming possibilities of ramp timer

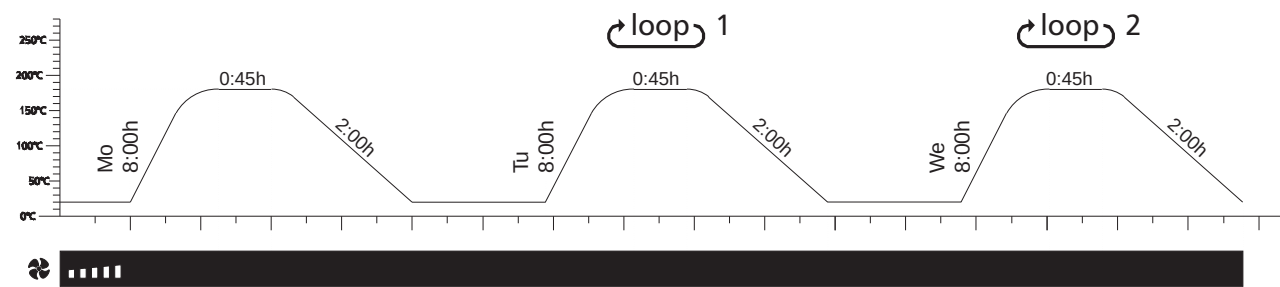
Different choice of  and delayed programme start  offer the following programming possibilities:

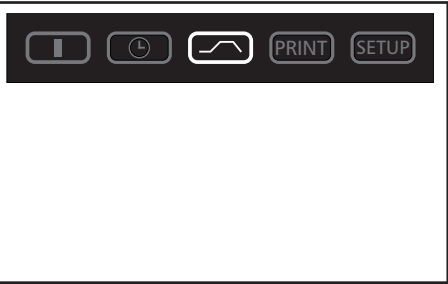
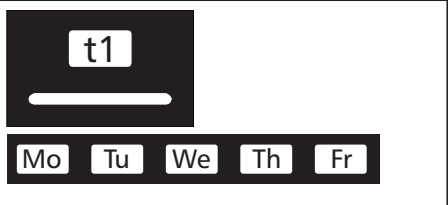
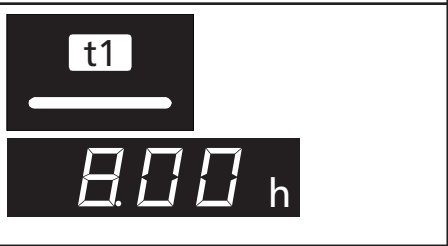


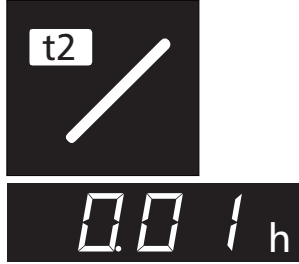
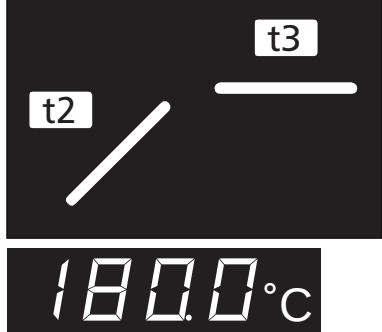
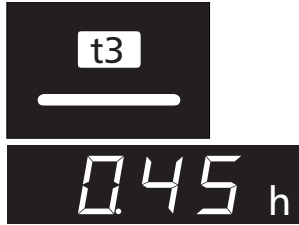
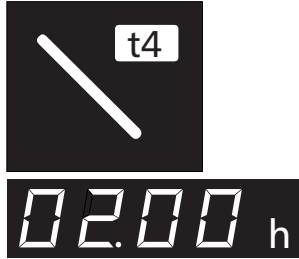
Programming example "Ramp timer"

The oven (UFE500) has to heat up as quickly as possible to 180°C on Monday at 08.00 hrs with a fan speed of 50%. After reaching the setpoint temperature this has to be held for 45 minutes, followed by cooling down over two hours.

This programme has to be repeated on Tuesday and Wednesday.



1. Select operating mode "Ramp timer" After holding down the SET key (approx. 3 sec) the current operating mode is flashing. Hold down the SET key and select operating mode "Ramp timer" using the push/turn control. After the SET key has been released the controller is in operating mode "Ramp timer".	
2. Switch-on day for delayed programme start Using the push/turn control select the ramp segment "t1". Hold down the SET key and set the workdays group using the push/turn control.	
3. Select switch-on time for delayed programme start Hold down the SET key and set the time 08:00 using the push/turn control.	

4. Select heating time t2 Using the push/turn control select the ramp segment "t2". Hold down the SET key and using the push/turn control set the time 00:01. (1 minute is sufficient since a setpoint-dependent waiting time is being set.)	
5. Select setpoint temperature Turn push/turn control clockwise until the temperature display is flashing. Hold down the SET the key and set the required temperature setpoint of 180°C using the push/turn control.	
6. Select setpoint-dependent waiting time Using the push/turn control select the symbol for setpoint-dependent waiting time. Hold down the SET key and set 0n using the push/turn control. After the SET key has been released the function for setpoint-dependent waiting time is stored. This ensures that, as rapidly as possible and immediately on reaching the setpoint temperature, the oven holds the temperature for 45 minutes (as selected above).	
7. Select hold time t3 Using the push/turn control select the ramp segment "t3". Hold down the SET key and set the time 00:45 using the push/turn control.	
8. Select cooling time t4 Using the push/turn control select the ramp segment "t4". Hold down the SET key and set the time 02:00 using the push/turn control.	
9. Select programme repeats Using the push/turn control select the loop symbol. Hold down the SET key and set 2 repeats using the push/turn control.	

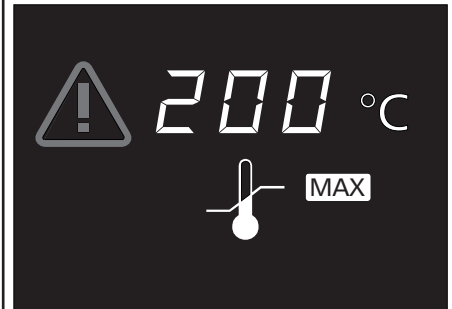
10. Select fan speed

Turn the push/turn control clockwise until the fan symbol is flashing.
Hold down the SET key and set fan speed 50% using the push/turn control.



11. Select monitor temperature

Turn the push/turn control clockwise until the monitor temperature display is flashing. Hold down the SET key and set the monitor temperature to 200°C using the push/turn control.



12. Start the programme

Turn the push/turn control clockwise until the stop symbol ■ is flashing.
Hold down the SET key and select start ► using the push/turn control.
On releasing the SET key the programme starts to run.



11. Basic oven settings SETUP



In this operating mode it is possible to make the basic settings for the oven. Clock time, date, day, year and calibration are set here.

The following parameters can be selected by turning the push/turn control, and altered as described in the Section ["Setting the parameters"](#):

<u>Clock time in 24-hour format</u> The winter/summer time changeover does not take place automatically but must be set manually by the user.	10.56 h	1
<u>Date</u> The controller incorporates a calendar which automatically allows for the different lengths of the months and also for leap years.	28.06	DATE
<u>Weekday</u>	Mo	DAY
<u>Year</u> Range: from 2000 to 2100	2008	YEAR
<u>Calibration temperature and calibration correction for user-calibration</u> CAL1 to CAL3 (see Section: "Calibration")		CAL. 1

11.1 Real-time clock

The real-time clock is set in SETUP and includes date and clock time.
The real-time clock serves for reports according to GLP.
Date and clock time are marked in the report memory.
On the graphics print from the PC the time axis is marked in real-time.
The clock runs with a buffer battery independently of the mains power supply.
The built-in lithium battery Type CR 2032 has a life of approx. 10 years.

12. Temperature monitor and protection devices

The monitor temperature is measured with a separate PT100 temperature sensor inside the chamber. The monitor unit provides protection for the oven load as well as protection for oven and its surroundings.

The oven is provided with duplicate overtemperature protection (mechanical / electronic) according to DIN 12 880.

visual alarm symbol

alight: TB alarm

flashing: TWW alarm

TWB alarm



Monitor temperature
(TWW, TWB)

12.1 Mechanical temperature monitor: temperature limiter (TB)

All ovens of the EXCELLENT series are equipped with a mechanical temperature limiter (TB) Protection Class 1 to DIN 12 880.

If the electronic monitor system should fail during operation and the fixed factory-set maximum temperature is exceeded by approx. 20°C the temperature limiter switches off the heating permanently as a final protective measure. The alarm symbol lights up as warning 

1. Fault rectification after the TB cut-out has been activated:
2. Switch off the oven and allow it to cool down
3. Rectify the fault (e.g. replace temperature probe) and where appropriate contact customer service
4. The oven is again ready for operation only after it has cooled down and after the fault has been rectified.

12.2 Electronic temperature monitor

Monitor temperature Range: up to 10°C max above nominal temperature (for nominal temperature see label)		Using the push/turn control select the symbol MAX . Hold down the SET key and set the protection temperature using the push/turn control.
--	--	---

Note:

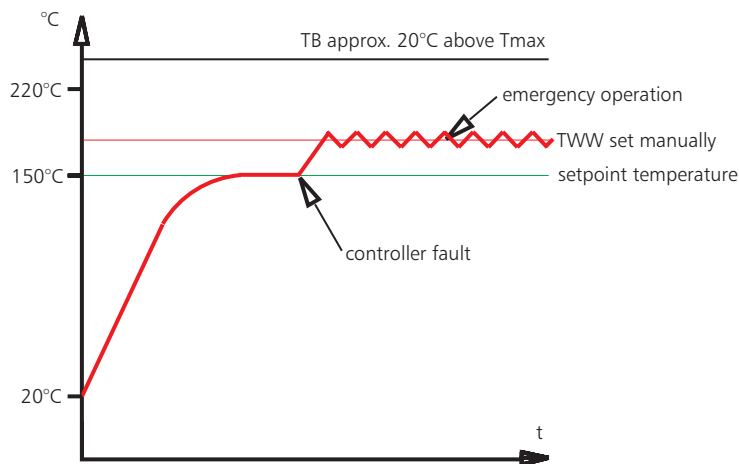
The temperature monitor can be set independently of the operating mode.

During ramp operation the monitor temperature must always be set sufficiently far above the maximum working temperature.

The manually set monitor temperature **MAX** of the electronic overtemperature protection system is monitored, in the case of EXCELLENT ovens, by an adjustable temperature monitor (TWW) Protection Class 3.1 to DIN 12 880, or as an option by an adjustable temperature limiter (TWB) Protection Class 2 to DIN 12 880. For details of temperature monitor system and Protection Class see label.

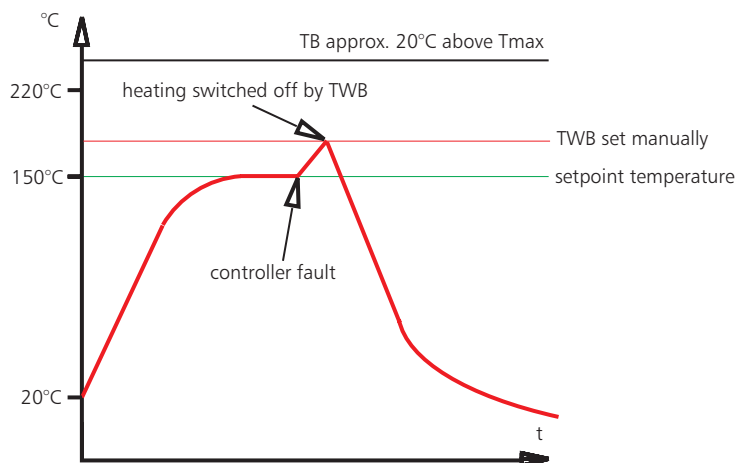
Adjustable temperature monitor (TWW) Protection Class 3.1 to DIN 12 880

If the manually set monitor temperatur **MAX** is exceeded, the TWW takes over the control of the temperature and starts to control at the monitor temperature. As a warning the alarm symbol  is flashing.



Adjustable temperature limiter (TWB) Protection Class 2 to DIN 12 880 (option)

If the manually set monitor temperatur **MAX** is exceeded, the TWB switches off the heating permanently and can only be reset by pressing the SET key. As a warning the alarm signal  is flashing.



13. Calibration

User-calibration of oven and controller, with three calibration temperatures selected by the user.

CAL.1 temperature calibration at low temperature

CAL.2 temperature calibration at medium temperature

CAL.3 temperature calibration at high temperature

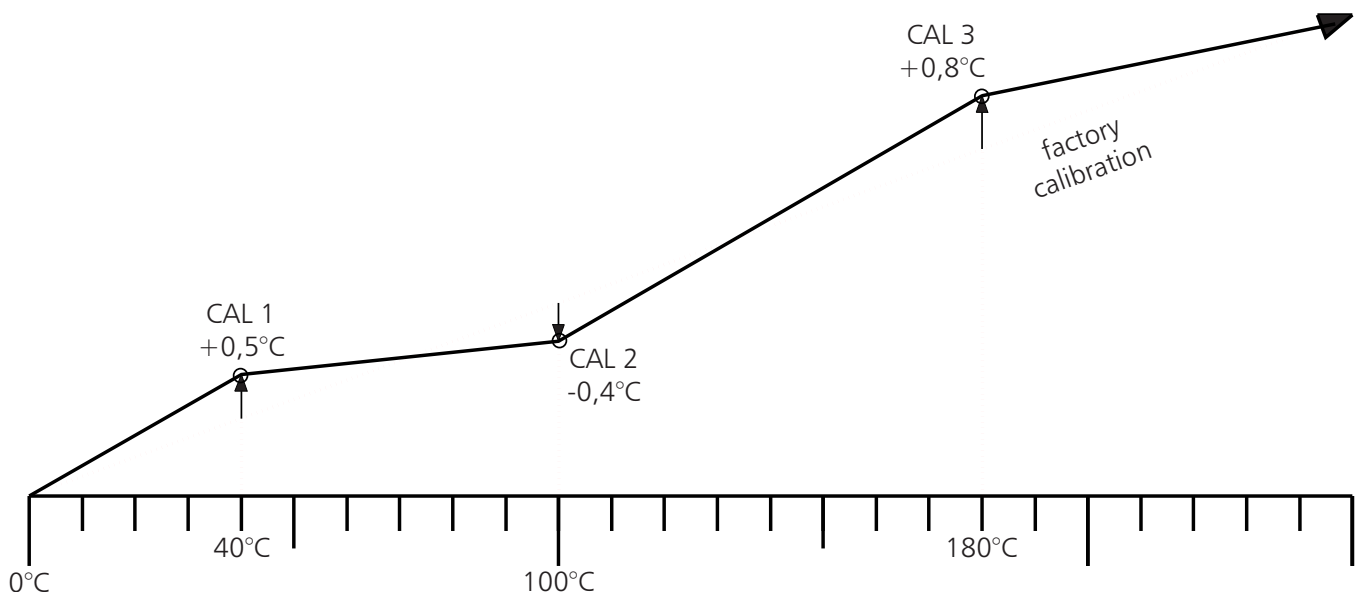
Either a positive or a negative calibration correction can be applied to each selected calibration point.

General calibration instructions:

1. Select the required calibration temperature in SETUP and set the corresponding calibration correction to 0.0°C.
2. Measure the deviation from the selected calibration temperature under steady conditions, using a reference instrument.
3. Set the calibration correction in SETUP. If the measured reference temperature is too low, the calibration correction setting has to have a positive sign.
4. Carry out a check measurement using the reference meter.
5. The procedure can be carried out for up to 3 calibration temperatures.

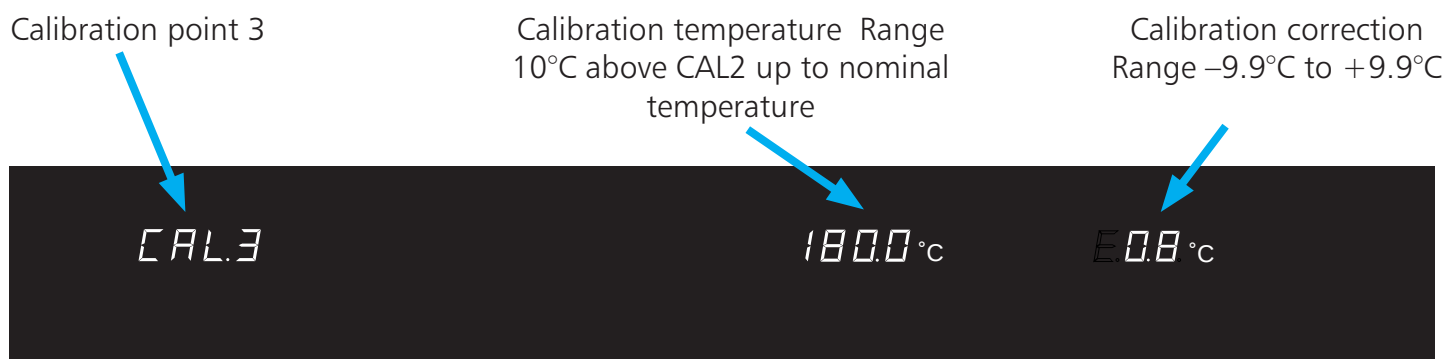
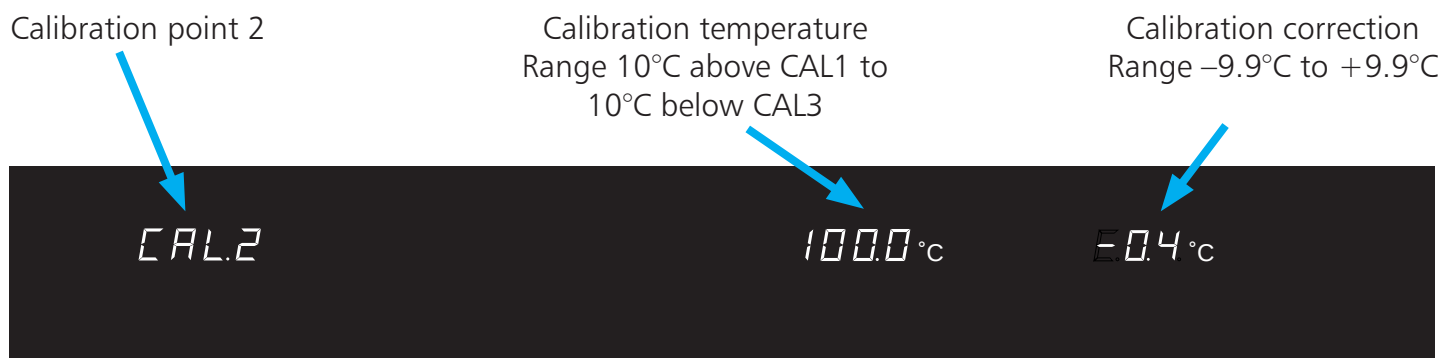
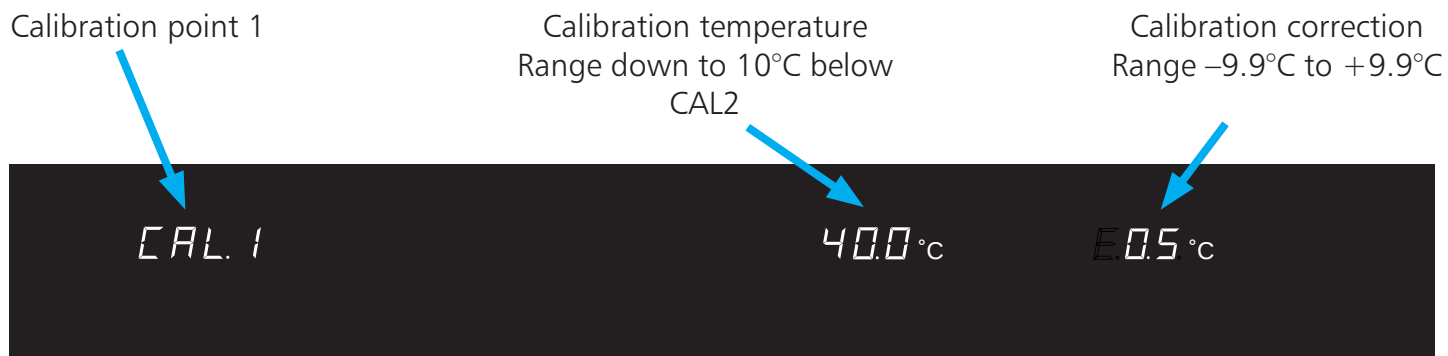
Example: Correction of a temperature deviation in the load at 100°C.

1. Set calibration temperature CAL.2 to 100.0°C in SETUP and set the corresponding calibration correction to 0.0°C.
2. Using a calibrated reference instrument, an actual temperature of 100.4°C is measured in normal operation for a setpoint temperature of 100°C.
3. In SETUP set the calibration correction for CAL.2 to -0.4°C.
4. After the oven has settled down the reference instrument should read 100.0°C.
5. With CAL.1 a further calibration temperature can be programmed below CAL.2, and with CAL.3 an additional calibration temperature above CAL.2.



Note:

If all calibration corrections are set to 0.0°C the factory calibration is restored.



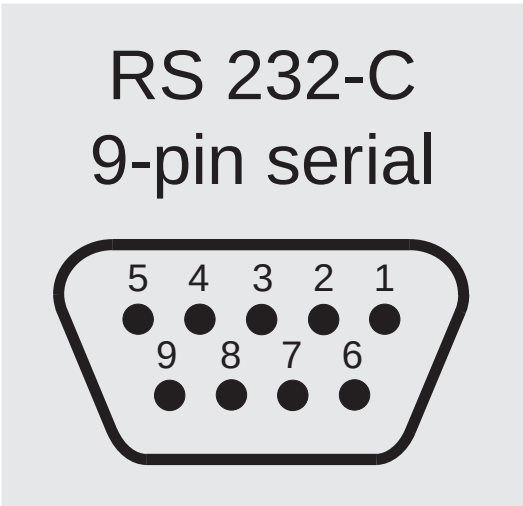
14. Communication interface RS232C for the PC

The oven is provided as standard with a serial communication interface RS232C according to DIN 12 900-1. Using this interface it is possible to control the oven from the PC and to produce reports. This is done using the "Celsius 2005" software.

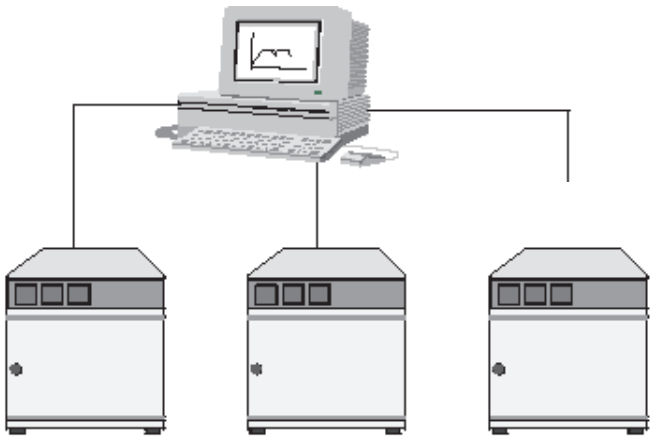
If several ovens are connected by the RS232C interface to one PC, each oven requires a corresponding interface on the PC as well as a separate cable.

The maximum cable length is 15 m.

For connection of the oven to the PC there is a 9-pin connector on the back of the oven. The oven can be connected to the PC using a screened interface cable. The screen has to be connected to the plug case. If the serial interface is not being used the cover supplied has to be fitted !



1	2	3	4	5	6	7	8	9
not used	RXD	TXD	not used	GND	not used	not used	not used	not used



15. Report memory

The controller continuously records all relevant measurements, settings and error messages at 1-minute intervals.

The internal report memory is arranged as a ring memory, i.e. the new data always overwrite the oldest report data.

The report function can not be switched off but remains active at all times. The data are stored in the controller, protected against any manipulation. The controller memory can be read to produce documentation.

Every data set is stored with a unique date stamp.

The size of the internal report memory is 1024kB. This corresponds to a memory capacity of approximately 6 months' continuous operation.

During ramp operation a larger amount of data are stored in the memory so that the maximum report duration may be reduced.

If the power supply is interrupted, the instants of power failure and restoration of power are stored in the controller.

15.1 Reading the report memory into the PC via RS232C

Using the "Celsius 2005" program the record memory of the controller can be read via the RS232C interface into a PC where it can be shown graphically, printed, and stored in memory.

Note:

The report memory of the controller is not altered or cleared by the reading procedure.

16. Sterilisers

16.1 Purpose definition for MEMMERT hot air sterilisers

The oven SNE/SFE is intended for the sterilisation of medical materials by dry heat using hot air at atmospheric pressure.

16.2 Guidelines for sterilisation in MEMMERT hot air sterilisers

For hot air sterilisation there are different regulations covering the temperature settings and the sterilisation times, as well as the packaging of the products to be sterilised. The values to be selected depend on the type and condition of the load to be sterilised and on the type of bacteria which have to be de-activated. Please make yourself familiar with the sterilisation method laid down for your application before carrying out sterilisation using your MEMMERT cabinet.

The operation of the MEMMERT hot air steriliser is also subject to the Standard DIN 58 947 Part 6.

A few examples of the correct preparation for different medical products are summarised in the following table:

Load	Preparation
Instruments (no soft solder)	load cleaned instruments, wrapped twice in aluminium foil or in steriliser foil suitable for hot air (recommended)
Cutting instruments	load cleaned instruments, wrapped twice in aluminium foil or in steriliser foil suitable for hot air (recommended)
Syringes (no plastics)	load plunger and cylinder separately, wrapped twice in aluminium foil or in steriliser foil suitable for hot air (recommended)
Glass and glass instruments	dismantle cleaned glass vessels and all-glass syringes and place into dishes, cool down slowly

Bottles, vessels and similar items must be sterilised without closure and with the opening downwards, in order to avoid the formation of cold air pockets. The recommended sterilisation temperature is usually 180°C (German Pharmacopoeia DAB 10).

Sterilisation should in all cases be carried out as setpoint-dependent operation, according to the following example. The holding time to be selected consists of the stabilisation time (i.e. the time until the desired temperature has been established within the entire steriliser chamber), the actual sterilisation time, and a safety margin.

The following table gives typical values for the holding time to be set, with different amounts of load, for sterilisers with and without fan. Please note that these values can be employed only with correct and loose distribution of the load. Notes on the correct loading of the steriliser can be found in these Operating Instructions and also on the label affixed to the steriliser.

Sterilisation temperature: 180°C	Type of loading:					
	light		medium		heavy	
Steriliser size	without fan	with fan	without fan	with fan	without fan	with fan
200	0:50 h	----	1:20 h	----	1:50 h	----
300	0:50 h	----	1:20 h	----	1:50 h	----
400	1:10 h	1:00 h	1:50 h	1:20 h	2:00 h	1:50 h
500	1:10 h	1:00 h	1:50 h	1:20 h	2:00 h	1:50 h
600	1:30 h	1:00 h	2:20 h	1:30 h	2:20 h	2:20 h
700	1:30 h	1:00 h	2:20 h	1:30 h	2:20 h	2:20 h
800	1:40 h	1:10 h	2:20 h	1:40 h	2:50 h	2:20 h

The sterilisation time is increased by a factor of 4 when sterilising at a temperature of 160°C. On large sterilisers and with heavy loading it is recommended to use wire shelves (special accessory) instead of perforated shelves.

Especially with heavy loading of the steriliser it is not sufficient to use these typical values without further tests. Reliable sterilisation requires validation of the individual sterilisation process, e.g. with the aid of additional temperature probes or by using biological or chemical indicators.

In sterilisation processes the vent valve on the oven must be closed after the moist sterilisation load has been dried.

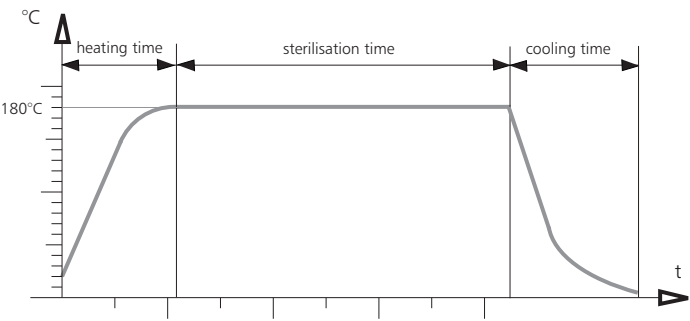


WARNING!

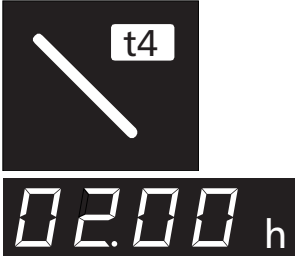
Models SNE700/800 and SFE700/800 are fitted with lockable doors. If the user, against our express warning, enters the steriliser chamber he must first remove the key and carry it on his person.

Programming example steriliser

The steriliser (SFE600) has to sterilise at a temperature of 180°C and a medium quantity of load for one hour and 30 minutes. By setting a cooling time of 2 hours the load can only be removed after it has cooled down.

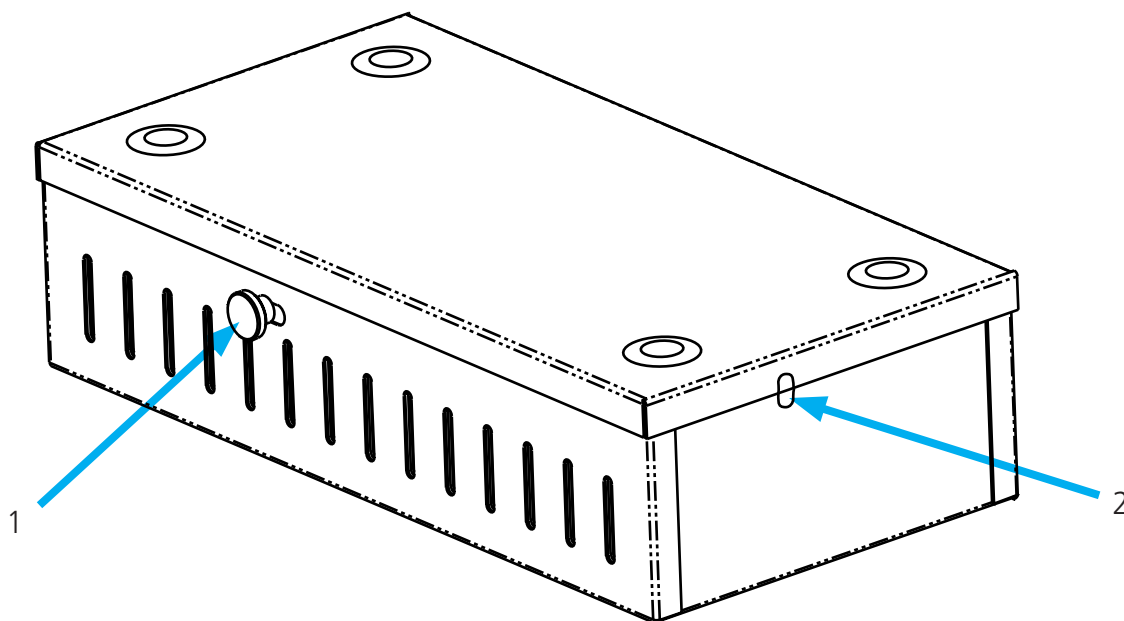


1. Select operating mode "Ramp timer" After holding down the SET key (approx. 3 sec) the current operating mode is flashing. Hold down the SET key and select operating mode "Ramp timer" using the press/turn control.	
2. No switch-on day for delayed programme start The sterilisation programme has to start immediately, therefore no day is selected for ramp segment "t1" with the push/turn control.	
3. Select heating time t2 Using the push/turn control select the ramp segment "t2". Hold down the SET key and using the push/turn control set the time 00:01. (1 minute is sufficient since a setpoint-dependent waiting time is being set).	
4. Select setpoint temperature Turn the push/turn control clockwise until the temperature display is flashing. Hold down the SET key and set the required temperature setpoint of 180°C using the push/turn control.	
5. Select setpoint-dependent waiting time Using the push/turn control select the symbol for setpoint-dependent waiting time. Hold down the SET key and set 0n using the push/turn control. After the SET key has been released the function for setpoint-dependent waiting time is stored, ensuring that the sterilisation time only begins when the selected temperature setpoint has been reached.	

6. Select hold time t3 Using the push/turn control select the ramp segment "t3". Hold down the SET key and set the time 01:30 using the push/turn control.	
7. Select cooling time t4 Using the push/turn control select the ramp segment t4. Hold down the SET key and set the time 02:00 using the push/turn control.	
8. Select fan speed Turn the push/turn control clockwise until the fan symbol is flashing. Hold down the SET key and set fan speed 50% using the push/turn control.	
9. Select monitor temperature Turn the push/turn control clockwise until the monitor temperature display is flashing. Hold down the SET key and set the monitor temperature to 200°C using the push/turn control.	
10. Start the programme Turn the push/turn control clockwise until the stop symbol ■ is flashing. Hold down the SET key and select start ► using the push/turn control. On releasing the SET key the programme starts to run.	

16.3 Steriliser cassettes

The cassettes should preferably be so arranged in the steriliser that the hot air flow can pass readily through the air slots.



The load to be sterilised is placed into the steriliser cassettes wrapped in aluminium foil or in steriliser foil suitable for hot air (as in the Table in the Section “Guidelines for sterilisation”). The air slots in the cassette must be open for sterilisation.

A temperature probe to confirm the temperature of the load can be introduced through the opening (2). After sterilisation has been completed the air slots must be closed by moving the slide knob (1). The sterilised and packed load can then be stored briefly in the closed cassette.

17. Cleaning

Regular cleaning of the easy-to-clean inside of the chamber prevents deposits which over time can detract from the appearance and the functionality of the stainless steel chamber .

The metal surfaces of the oven can be cleaned with commercially available cleaning agents for stainless steel. It is important to ensure that no rust-forming object comes into contact with the chamber or the stainless steel casing. Rust deposits cause infection of the stainless steel.

If any contamination causes rust stains on the surfaces of the chamber, such spots must be cleaned off immediately and the area polished.

WARNING !

The control panel, the plastic input modules and other plastic components of the oven must not be cleaned using scouring cleaning agents or those containing solvents.

18. Maintenance

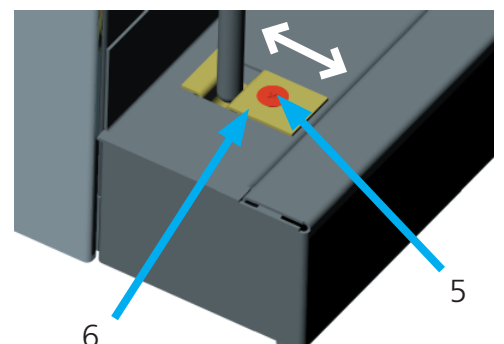
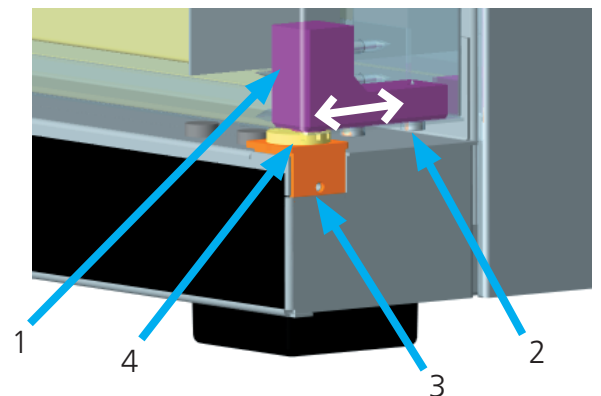
Important for a long life of your MEMMERT product and in case of warranty claims.

Any work involving opening up the oven must only be carried out by a suitably qualified electrician.

MEMMERT products require little maintenance. It is however recommended to lubricate all moving parts of the doors (hinges and closure) once a year (or 4 times a year with continuous operation) using a thin Silicone grease, and to check that the hinge screws are tight.

A well-closing door is essential on an oven. On Memmert ovens, tight closure of the door is ensured by a seal on the oven and another one on the door. In continuous operation the flexible sealing material may take a permanent set. Readjustment may then be necessary in order to ensure proper closing of the door.

- The top part (1) of the door hinge can, after releasing the 2 screws (2) at the top or bottom of the door, be moved slightly in the direction of the arrow.
- The door can be adjusted after releasing the socket screw (3) and rotating the excentric (4) by means of a screwdriver. NOTE ! Screw (3) is locked with locking varnish. It can be released by a sharp tug using a hexagon socket key. Apply more locking varnish to screw (3) and tighten it.



The closing panel (6) can also be adjusted in the direction of the arrow after releasing the screw (5). It is important that the panel is then screwed down firmly.

19. Error messages

E-0	Error on self test
E-1	Power module triac faulty
E-2	Power module faulty
E-3	PT100 temperature probe faulty
E-L1	Fehler Kommunikation zum Leistungsteil L1
E-L2	Fehler Kommunikation zum Leistungsteil L2
E-L3	Fehler Kommunikation zum Leistungsteil L3
E-LA	Fehler Kommunikation zu allen Leistungsteilen (evtl. Regler defekt)

In case there is a fault on the oven, please get in touch with an authorised service organisation or contact the Memmert customer service department.

When dealing with the service department always quote the product serial number on the oven label.

20. Supply failure

Supply failure in operating mode "Normal operation"

After a supply failure the operation is continued with the set parameters. The instant and duration of the supply failure are documented in the record memory.

Supply failure in operating mode "Weekly programmer"

After a supply failure the operation is continued with the set parameters. The instant and duration of the supply failure are documented in the record memory.

Supply failure in programme operation

After a supply failure lasting less than 15 minutes the current programme is continued at the point where it was interrupted. The instant and duration of the supply failure are documented in the report memory. After a supply failure of more than 15 minutes, the ovens starts in normal operation, for safety reasons, and all settings are set to safe default values.

Supply failure in remote operation

On a supply failure in remote operation the oven immediately starts in normal operation for safety reasons and all settings are set to safe default values (see table). Programme continuation has to take place from the PC. The instant and duration of the supply failure are documented in the report memory.

Parameter	Default value
Temperature	20 °C
Fan speed	maximum



EC Declaration of Conformity

Manufacturer's name and address: MEMMERT GmbH + Co. KG
Äußere Rittersbacher Straße 38
D-91126 Schwabach

Product: Universal oven

Type: UNB ... / UFB ... / UNE ... / UFE ... / UNP ... / UFP ...

Sizes: 100 / 200 / 300 / 400 / 500 / 600 / 700 / 800

Nominal voltage: AC 230 V or 3 ~ AC 400 V 50 / 60 Hz
alternative AC 115 V 50/60 Hz

The designated product is in conformity with the European EMC-Directive

89/336/EEC

including amendments

Council Directive of 03 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

DIN EN 61 326 (VDE 0843 part 20): 1998-01
DIN EN 61 326/A1 (VDE 0843 part 20/A1): 1999-05
RFI suppression: Class B
DIN EN 61 000-3-11 (VDE 0838 part 11): 2001-04

EN 61 326: 1997
EN 61 326: 1997/A1 : 1998

EN 61 000-3-11: 2000

The designated product is in conformity with the European Low Voltage Directive

73/23/EEC

including amendments

Council Directive on the approximation of the laws of the Member States relating to Electrical equipment for use within certain voltage limits.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

DIN EN 61 010-1 (VDE 0411 part 1): 1994-03
DIN EN 61 010-2-010 (VDE 0411 part 2-010): 1995-03

EN 61 010-1: 1993
EN 61 010-2-010: 1994

Schwabach, 03.09.04



(Legally binding signature of the issuer)

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety note given in the product documentation which are part of the supply, must be observed.



EC Declaration of Conformity

Manufacturer's name and address: MEMMERT GmbH + Co. KG
Äußere Rittersbacher Straße 38
D-91126 Schwabach

Product: Incubators

Type: INB ... /INE ... / INP ...

Sizes: 200 / 300 / 400 / 500 / 600 / 700 / 800

Nominal voltage: AC 230 V 50/60 Hz
alternative AC 115 V 50/60 Hz

The designated product is in conformity with the European EMC-Directive

89/336/EEC

including amendments

Council Directive of 03 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

DIN EN 61 326 (VDE 0843 part 20): 1998-01
DIN EN 61 326/A1 (VDE 0843 part 20/A1): 1999-05
RFI suppression: Class B
DIN EN 61 000-3-11 (VDE 0838 part 11): 2001-04

EN 61 326: 1997
EN 61 326: 1997/A1 : 1998

EN 61 000-3-11: 2000

The designated product is in conformity with the European Low Voltage Directive

73/23/EEC

including amendments

Council Directive on the approximation of the laws of the Member States relating to Electrical equipment for use within certain voltage limits.

Full compliance with the standards listed below proves the conformity of the designated product with the essential protection requirements of the above-mentioned EC Directive:

DIN EN 61 010-1 (VDE 0411 part 1): 1994-03
DIN EN 61 010-2-010 (VDE 0411 part 2-010): 1995-03

EN 61 010-1: 1993
EN 61 010-2-010: 1994

Schwabach, 03.09.04



(Legally binding signature of the issuer)

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety note given in the product documentation which are part of the supply, must be observed.



EC Declaration of Conformity

Manufacturer's name and address: MEMMERT GmbH + Co. KG
Äußere Rittersbacher Straße 38
D-91126 Schwabach

Product: Steriliser

Type: SNB ... / SFB ... / SNE ... / SFE ... / SFP ...

Sizes: 100 / 200 / 300 / 400 / 500 / 600 / 700 / 800

Nominal voltage: AC 230 V oder 3 ~ AC 400 V 50 / 60 Hz
alternative AC 115 V 50/60 Hz

The product meets the regulations of the directive

93/42/EWG

Directive of the council to adapt legal regulations of the member states on the subject of medical products dd. 14.06.1993 (Abl. EG Nr. L 169, S. 1, 12.07.1993) including annex and modifications.

Schwabach, 24.01.05



(Legally binding signature of the issuer)

This declaration certifies compliance with the above mentioned directives but does not include a property assurance. The safety note given in the product documentation which are part of the supply, must be observed.

Standard ovens (UNE / UFE / INE) are safety-approved and bear the test marks:



Sterilisers (SNE / SFE) are safety-approved and bear the test marks:



22. Address and customer service

MEMMERT GmbH+Co.KG
PO Box 17 20
91107 Schwabach
Germany
Phone: (+49) (0)9122 / 925-0
Fax: (+49) (0)9122 / 14585
E-mail: sales@memmert.com
Internet: www.memmert.com

Customer service:
Phone: (+49) (0)9122 / 925-143
or (+49) (0)9122 / 925-126
E-mail: service@memmert.com

When contacting customer service, always quote the product serial number on the oven label.



23. Index

A

accessories 9
address 40
air changes 11
air supply 10
alarm indication 11
alarm symbol 24, 25

C

calibration 26
calibration correction 26
calibration temperature 26
CE conformity declaration 37
cleaning 35
clock time 23
communication interface 28
connection 8
construction, oven 10
controls 11
cooling time 17
customer service 40

D

date 23
day groups 15
delayed programme start 17
DIN 12 880 24
door 10
door handle 10

E

error messages 36

F

fan 10
fan indication 11

H

heating time 17
hold time 17

I

indications 11
initial start-up 5
installation facilities 9
interface, communication 28

L

load, oven 5

M

maintenance 35
material quality 4, 7
medical product 4
memory, report 29

N

normal operation 13

O

OFF time 15
ON time 15
operating mode, selection of 12
operating mode indication 11
operation 10
oven settings, basic 23

P

parameters, setting the 12
Protection Class 1 24
Protection Class 2 25
Protection Class 3.1 25
protection devices 24
purpose, intended 4, 30

R

ramp timer 17
real-time clock 23
repeat function 17
report memory 29
RS232C 28

S

setpoint-dependent waiting
time 17
settings, basic oven 23
SETUP 23
stacking 9
standard equipment 7
start-up 5
steriliser cassettes 34
sterilisers 30
subframe 9

T

TB 24
temperature, setting the 11
temperature calibration 26
temperature deviation 26
temperature display 11
temperature limiter 24
temperature monitor 24
temperature setpoint 11
time display 11
transport 4
TWB 25
TWW 25

W

wall bracket 9
weekday 15, 23
weekly programmer 15

Y

year 23

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24.01.2005
EXCELLENT englisch

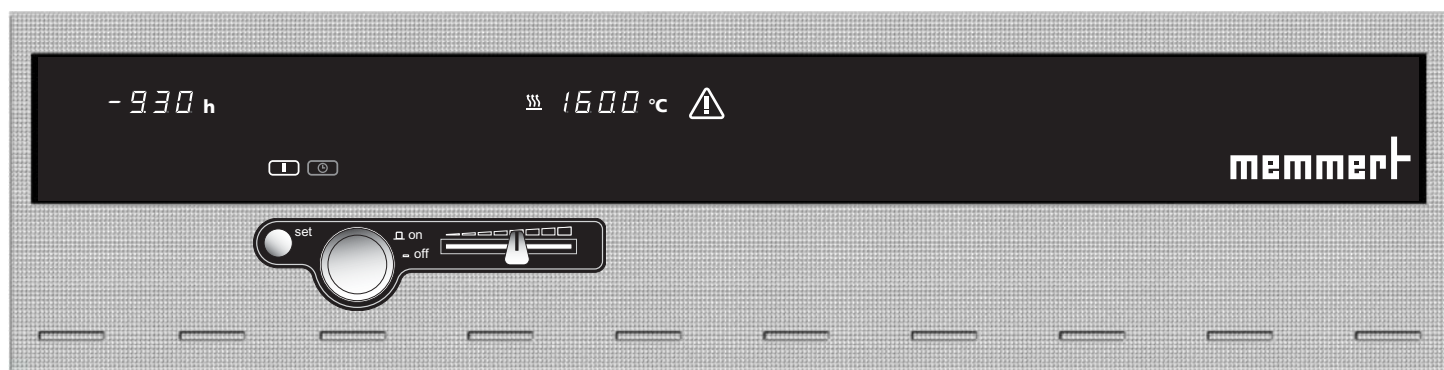
D09804

U → Universal ovens

I → Incubators

S → Sterilisers

Service Instructions



1. Contents

1.	Contents.....	3
2.	Safety notes.....	4
3.	Repair instructions	5
4.	Fault finding and error messages.....	5
4.1	Additional error messages on 3-phase ovens (Model Uxx 700-800)	6
5.	Tools required	6
6.	Removing the housing cover	7
7.	Overall view control chamber.....	8
8.	Replacing the power unit	10
9.	Changing fuses.....	10
10.	Replacing main switch module incl. turn control	11
11.	Replacing controller (BASIC)	12
12.	Replacing controller (EXCELLENT)	13
13.	Replacing controller (PERFECT)	14
14.	Replacing temperature limiter TB.....	15
15.	Replacing control chamber fan.....	16
16.	Replacing Pt100 temperature probe	16
17.	Changing the circulating fan motor.....	17
18.	Adjusting and dismantling the inner door on incubators (lxx)	18
19.	Door – maintenance and adjustment	19
19.1.	Dismantling the door.....	19
19.2.	Adjusting the door.....	19
19.3.	Door closure – maintenance and dismantling	20
20.	Replacing the door seal.....	22
21.	Changing the working chamber seal	22
22.	Replacing the heating	23
22.	Wiring diagram.....	26
24.	Index	34
25.	Address and customer service	35

2. Safety notes



Always before dismantling the equipment – pull out the mains supply plug!



Work involving opening the housing must only be carried out by a qualified electrical technician!



Please observe the safety notes and instructions in the Operating Instructions supplied with the equipment!



Dismantling the equipment may give access to unfinished metal edges, therefore always wear gloves during all work!



Observation of the notes in these Service Instructions is essential for correct operation of the oven. Disregarding these instructions results in exclusion of warranty, guarantee and damage claims!



On first start-up after any maintenance or repair the equipment should not be left unsupervised until steady conditions have been reached!

3. Repair instructions

These instructions describe service and maintenance operations as well as steps for dismantling of BASIC, EXCELLENT and PERFECT ovens.

Unless otherwise described, assembly takes place in the reverse order.

Alterations in technical matters are reserved. Measurements are not binding.

4. Fault finding and error messages

Fault details	Fault cause	Fault rectification	Section
General faults			
Controller display remains dark	Fuse 100 mA (80 mA) has blown	Check fuse and replace if nec.	Section 9
	Main fuse 15 A has blown	Check fuse and replace if nec.	Section 9
	Power unit faulty	Replace power unit	Section 8
Temperature can not be set and oven can not be operated by turn control.	Turn control faulty	Replace main switch module incl. turn control	Section 10
	Oven "blocked" by UserID card	Unblock using UserID card	siehe Betriebsanleitung
Error messages in monitor indication			
Warning – symbol  alight continuously	Mechanical-action temperature limiter has switched off the heating	- Switch off oven and allow to cool down. - Check Pt100 temperature probe. - Check temperature limiter - The oven is again ready for operation only after fault has been rectified and the oven has cooled down.	Section 14
Warning – symbol  flashing	Monitor controller has switched off the heating because temperature difference between working controller and monitor controller is too small.	Increase temperature difference between monitor temperature and working temperature. If nec. replace Pt100 temperature probe on monitor controller	Section 16
Error message „E-3“	Pt100 temperature probe of monitor controller is faulty.	Replace Pt100 temperature probe of monitor controller on connector J3	Section 16
Error message „E-3“ alternating with temperature display	Pt100 temperature probe of monitor controller is faulty. Monitor controller operates in emergency mode with temperature value of working controller Pt100 temperature probe	Replace Pt100 temperature probe of monitor controller on connector J3.	Section 16
Error message in timer display			
Error message „E-0“	Serious configuration error (e.g. incorrect oven type or incorrect temperature range)	Replace controller	Section 11-13
Error message „CONF“ (display only appr. 10 sec after switching on)	Checksum error (error on storing the setpoints, e.g. fan speed)	The fault can be rectified by the controller itself after repeating the storage function of a setpoint parameter. If the fault is repeated or can not be rectified, the controller has to be replaced	Section 11-13
Error message „E-L1“ in timer display	Interruption in communication to power unit	Check connecting cable. If nec. replace power unit	Section 8
Error messages in temperature display			
Error message „E-3“	Pt100 temperature probe of working controller faulty	Replace Pt100 temperature probe of working controller on connector J4	Section 16
Error message „E-3“ alternating with temperature display	Pt100 temperature probe of working controller is faulty. Working controller operates in emergency mode with the temperature value of monitor controller Pt100 temperature probe.	Replace Pt100 temperature probe of working controller on connector J4.	Section 16
Error message „E-1.1“	Power unit triac 1 faulty	Replace power unit	Section 8
Error message „E-1.2“	Power unit triac 2 faulty	Replace power unit	Section 8
Error message „E-2.1“	Power unit faulty	Replace power unit	Section 8
Error message „E-2.2“	Power unit faulty	Replace power unit	Section 8

4.1 Additional error messages on 3-phase ovens (Model Uxx 700-800)

Error messages in timer display			
Error message „E-L1“ in timer display	Communication to power unit phase L1 address#0 interrupted	Check fuse. Check connecting cable. If nec. replace power unit	Section 8
Error message „E-L2“ in timer display	Communication to power unit phase L2 address#1 interrupted	Check fuse. Check connecting cable. If nec. replace power unit	Section 8
Error message „E-L3“ in timer display	Communication to power unit phase L3 address#2 interrupted	Check fuse. Check connecting cable. If nec. replace power unit	Section 8
Error message „E-LA“	Communication to all power units interrupted	Check fuse Check connecting cable Check coding switch setting If nec. replace power unit If nec. replace controller	Section 8 Section 11-13
Error messages in temperature display			
Error message „E-1.1“	Power unit phase L1 address #0 triac 1 faulty	Replace power unit phase L1 address #0	Section 8
Error message „E-1.2“	Power unit phase L1 address #0 triac 2 faulty	Replace power unit phase L1 address #0	Section 8
Error message „E-1.3“	Power unit phase L2 address #1 triac 1 faulty	Replace power unit phase L2 address #1	Section 8
Error message „E-1.4“	Power unit phase L2 address #1 triac 2 faulty	Replace power unit phase L2 address #1	Section 8
Error message „E-1.5“	Power unit phase L3 address #2 triac 1 faulty	Replace power unit phase L3 address #2	Section 8
Error message „E-1.6“	Power unit phase L3 address #2 triac 2 faulty	Replace power unit phase L3 address #2	Section 8
Error message „E-2.1“	Power unit faulty	Replace power unit	Section 8
Error message „E-2.2“	Power unit faulty	Replace power unit	Section 8
Error message „E-2.3“	Power unit faulty	Replace power unit	Section 8
Error message „E-2.4“	Power unit faulty	Replace power unit	Section 8
Error message „E-2.5“	Power unit faulty	Replace power unit	Section 8
Error message „E-2.6“	Power unit faulty	Replace power unit	Section 8

5. Tools required

Torx screwdriver size 8 and 10

Phillips screwdriver

Side-cutter pliers

Flat pliers for pulling off the connecting cables

Socket keys/spanners SW5.5 SW10 SW13

Hexagon socket driver 2 mm for door hinge

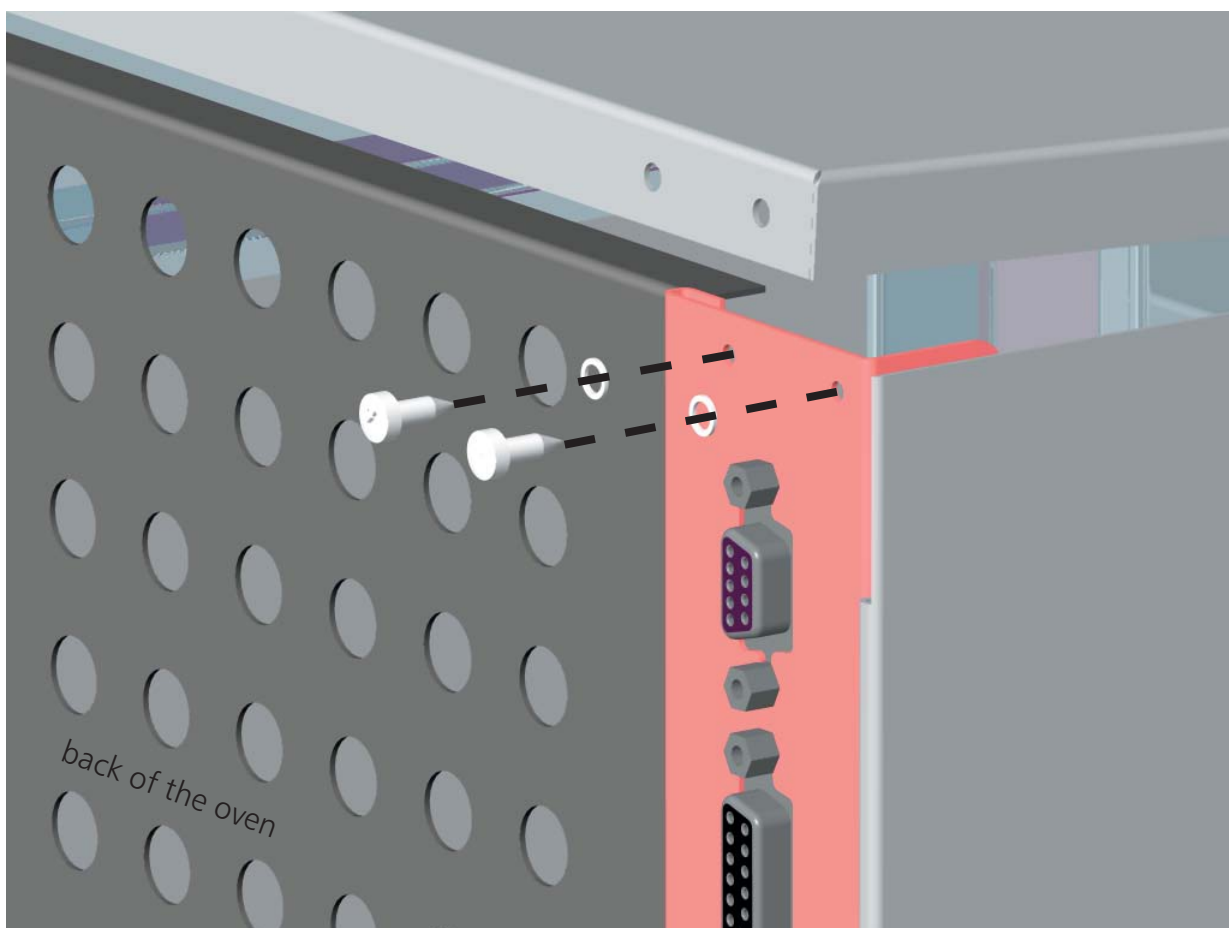
Multimeter with voltage and resistance ranges

Cable binder

Adhesive tape for identifying cables and assemblies

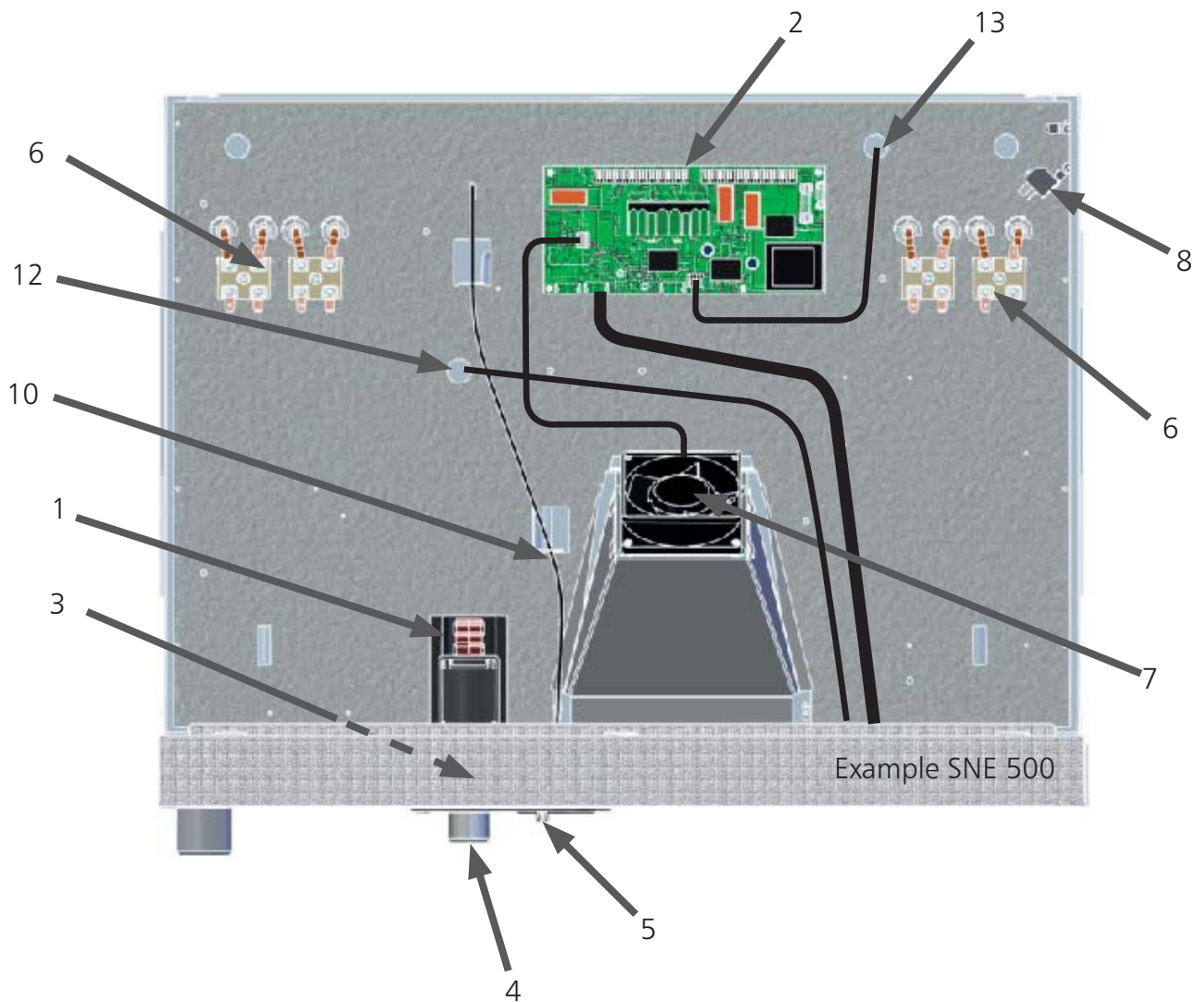
6. Removing the housing cover

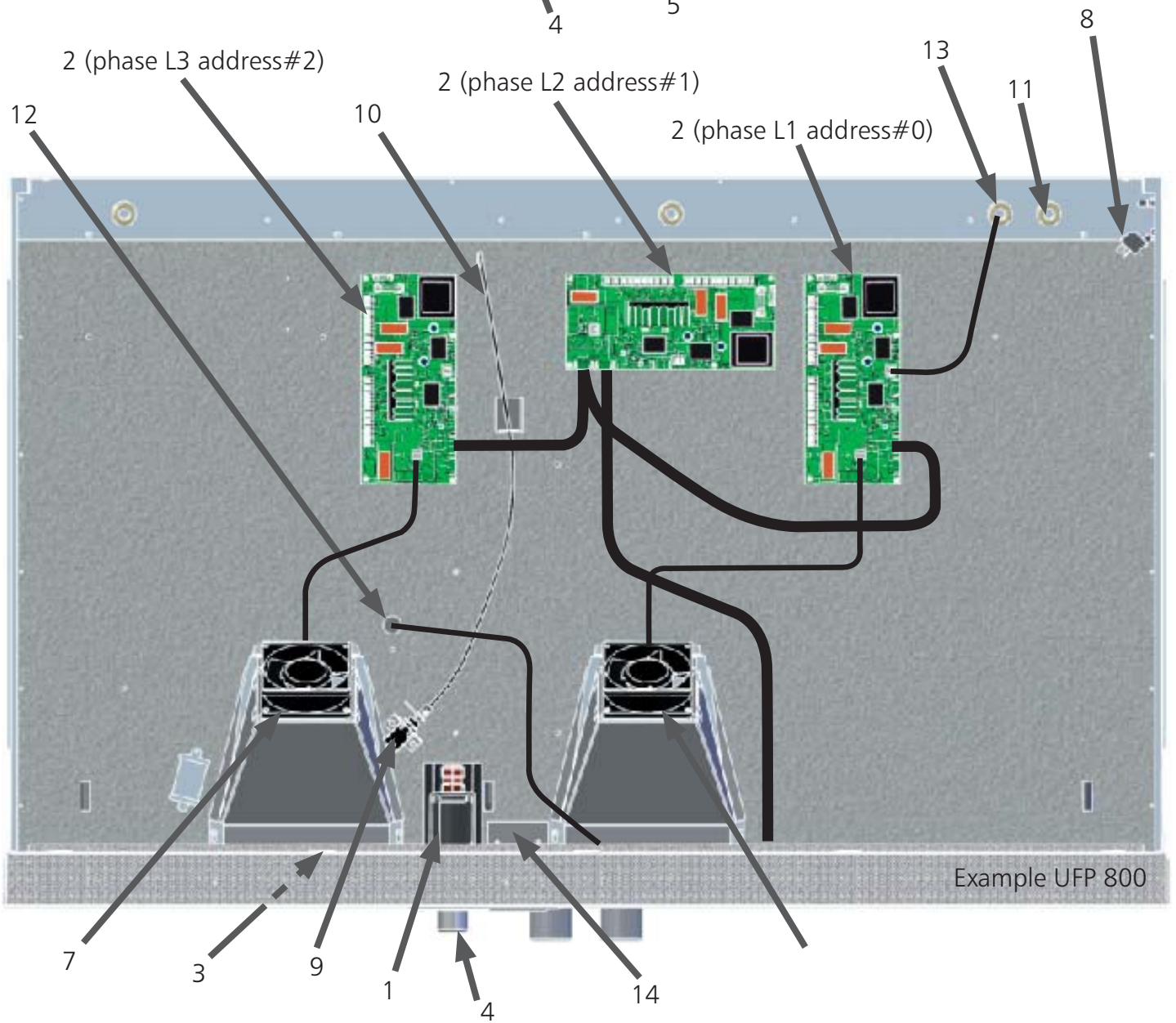
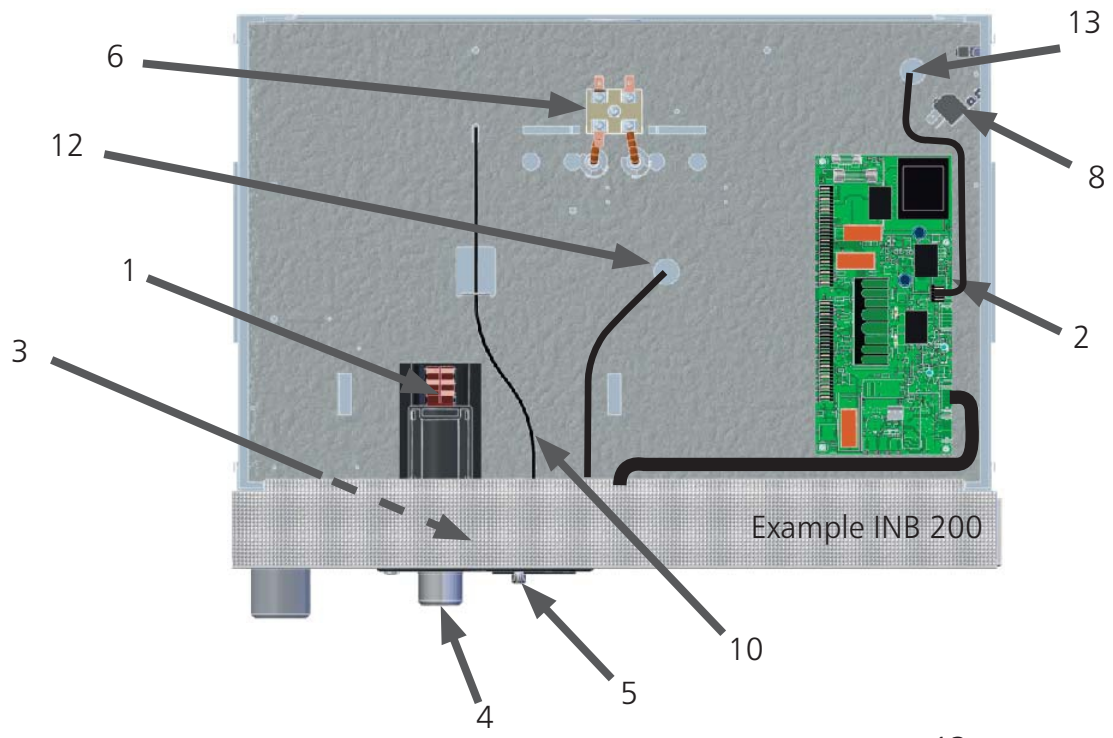
- Pull off the mains plug !
- Unscrew 4 screws on the back of the oven
- Slightly raise the cover at the back and pull out towards the back
- During re-assembly, check that there are spring washers underneath the screws in order to ensure secure protective earth connection to the cover



7. Overall view control chamber

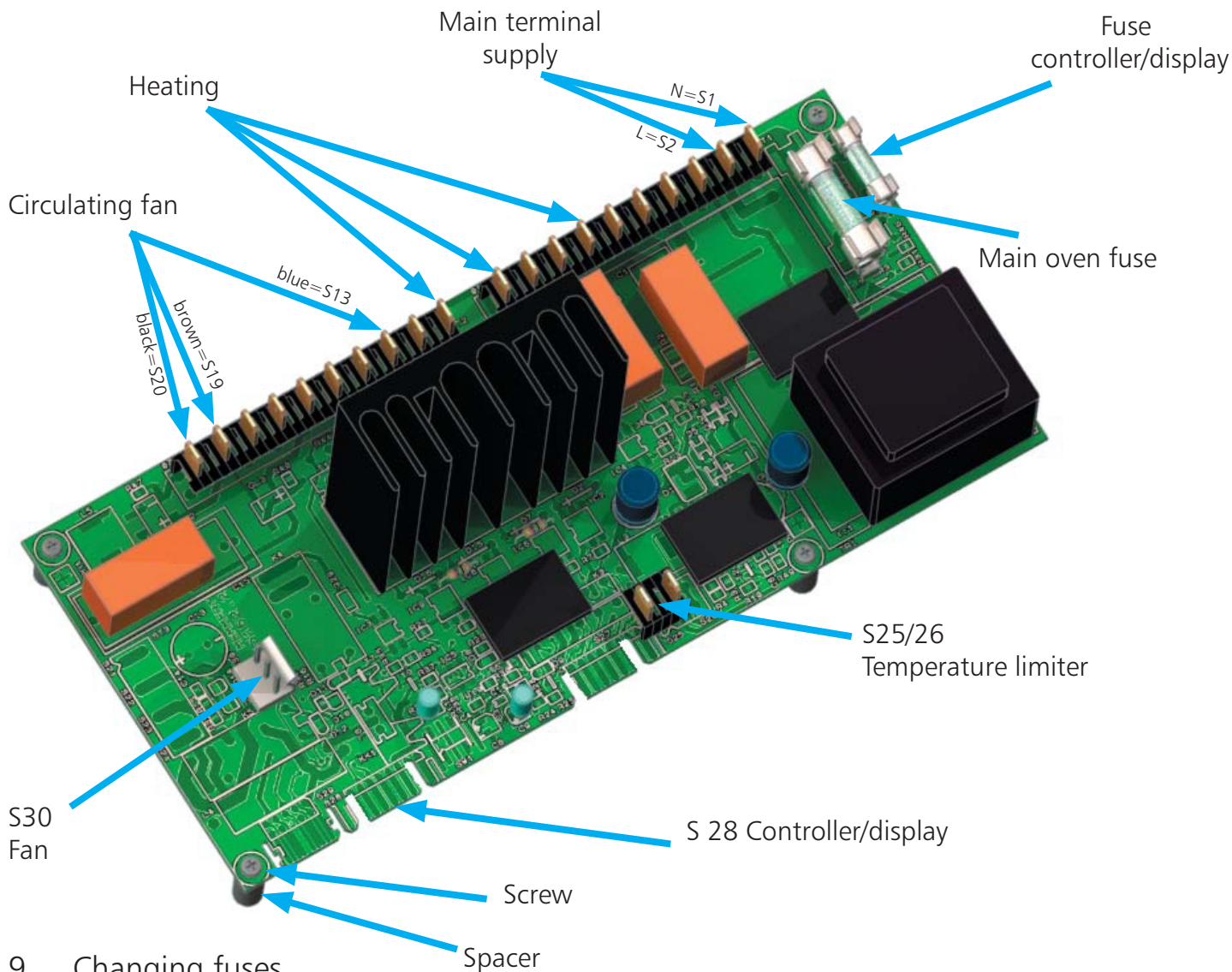
- 1 = main switch
- 2 = power unit
- 3 = controller (see also Section 11-13)
- 4 = turn control
- 5 = air flap (xxB/xxE)
- 6 = heater terminals
- 7 = control chamber fan (not on xxB and lxx)
- 8 = main connection terminal
- 9 = air flap servo (P only)
- 10 = air flap spindle
- 11 = feed-through heating (600 – 800)
- 12 = feed-through Pt100 temperature probe
- 13 = feed-through temperature limiter
- 14 = chip card reader (xxP only)





8. Replacing the power unit

- Pull out the mains supply plug!
- Remove the housing cover
- Pull off all cables from power unit
- (if nec. apply markers to unmarked cables)
- Release 4 screws from power unit (ensure that spacers are not lost)



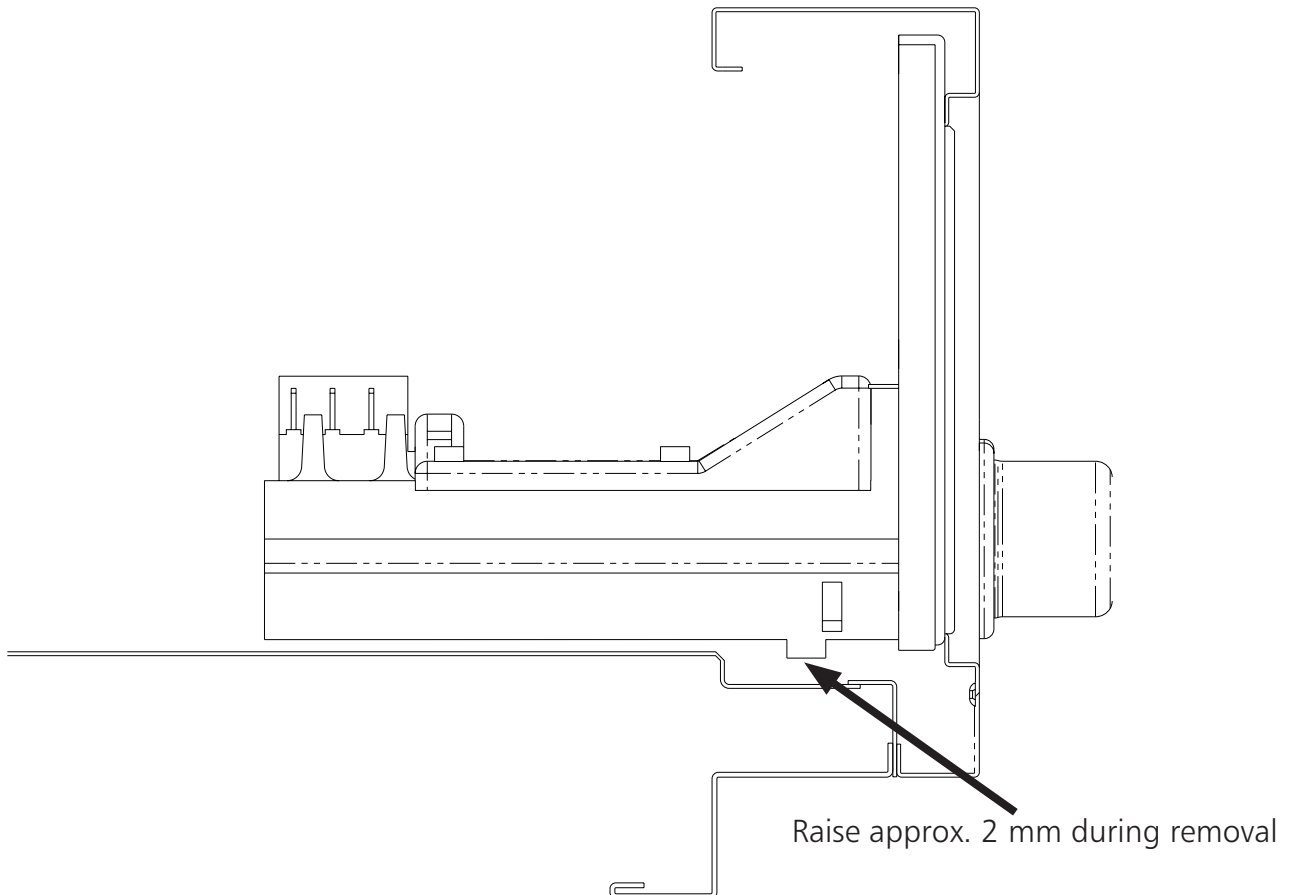
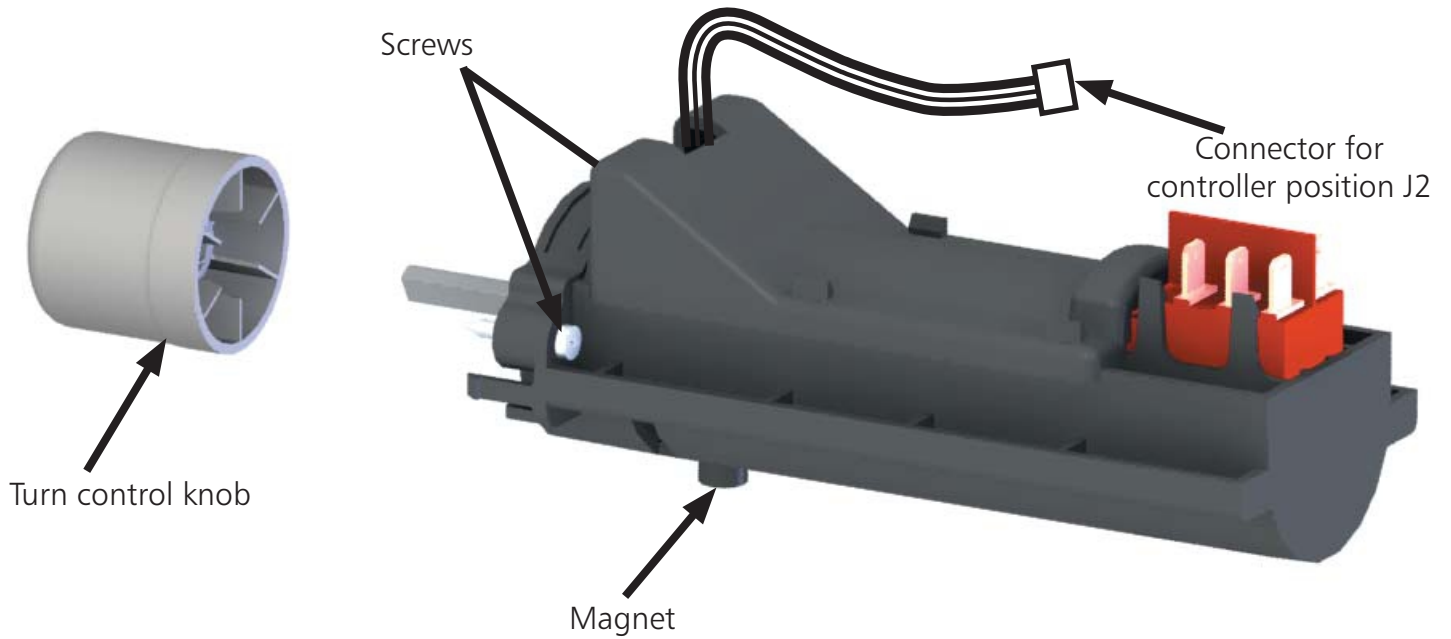
9. Changing fuses

- Pull out the mains supply plug !
- Remove the housing cover
- The two fuses are located on the power unit (see above)
- Check the fuse resistance with a continuity tester.
- If the fuse is OK the resistance is only a few Ohm.
- To change the fuse, place an insulated screwdriver from the side underneath the fuse and twist it to lift out the fuse from its holder. Push the new fuse from above into the holder.

Main oven fuse: 15 A fast 32 x 6.3 mm (American)
Fuse controller/display: EXCELLENT / PERFECT 100 mA slow 20 x 5 mm
BASIC 80 mA slow 20 x 5 mm

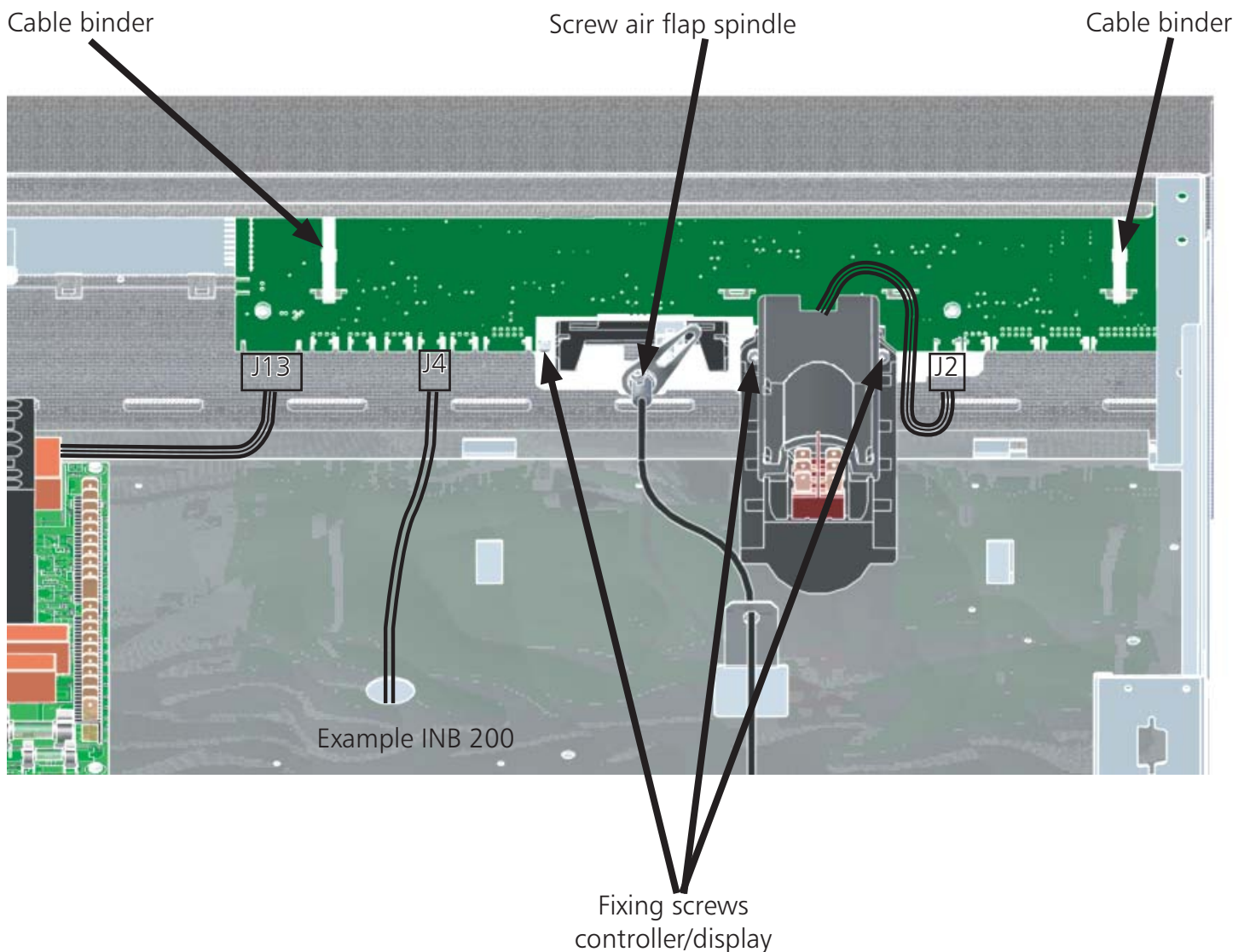
10. Replacing main switch module incl. turn control

- Pull out the mains supply plug!
- Remove the housing cover
- Pull off turn control knob
- Pull off connector (4-pin) from controller position J2
- Unscrew Phillips headed screws (2x) from main switch module
- Pull out main switch module towards the back (slightly raise the main switch module – note magnet on module underside)



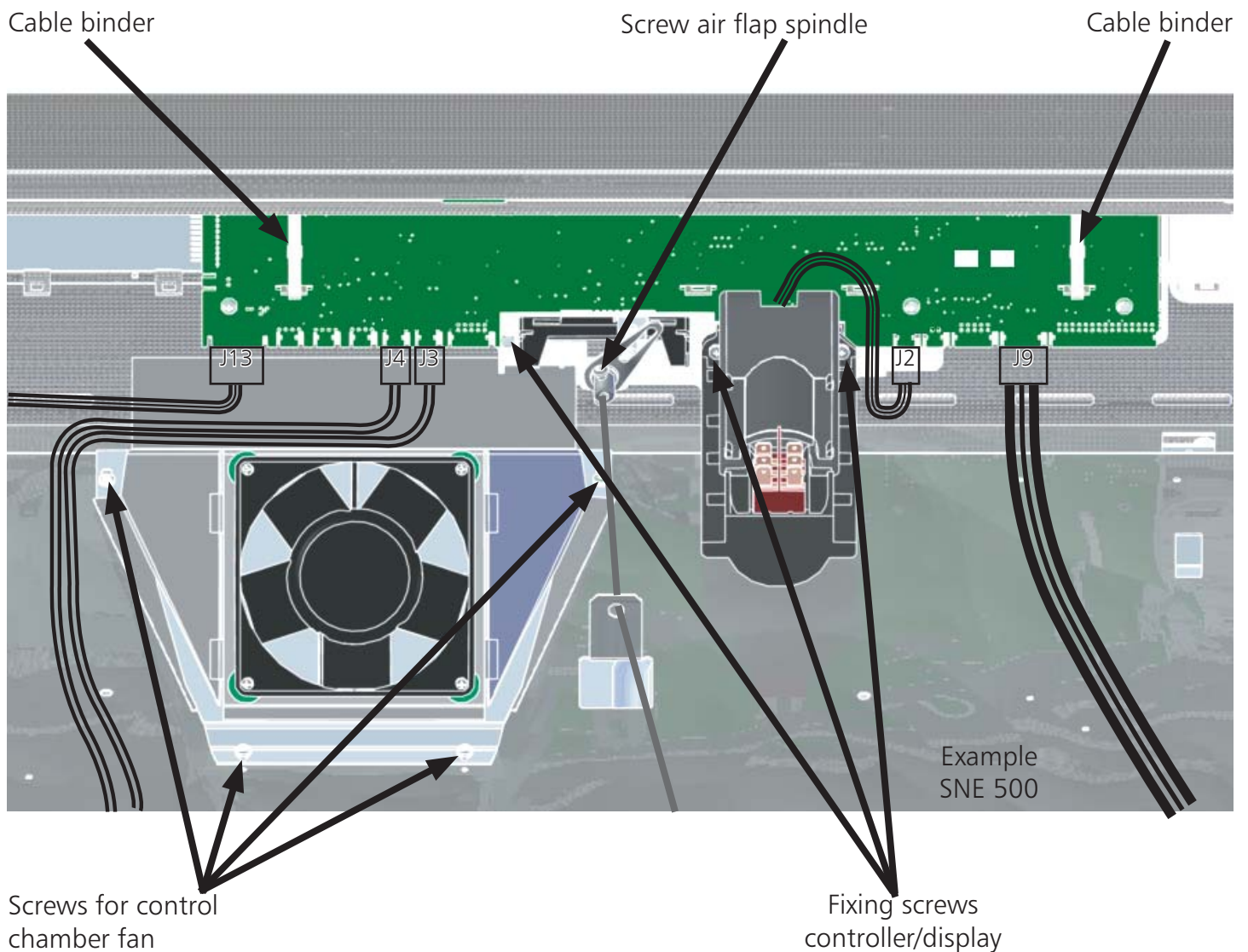
11. Replacing controller (BASIC)

- Pull out the mains supply plug!
- Remove the housing cover
- Pull off the turn control knob towards the front
- Cut the cable binder with the side cutters and remove it
- Release the screw from the air flap spindle and remove the spindle
- Disconnect the cable (8-way) for power supply from controller location J13
- Remove connector (4-pin) for Pt100 working controller from controller location J4
- Remove connector (4-pin) for main switch from controller location J2
- Release three fixing screws (see ill.)
- Remove the controller towards the back



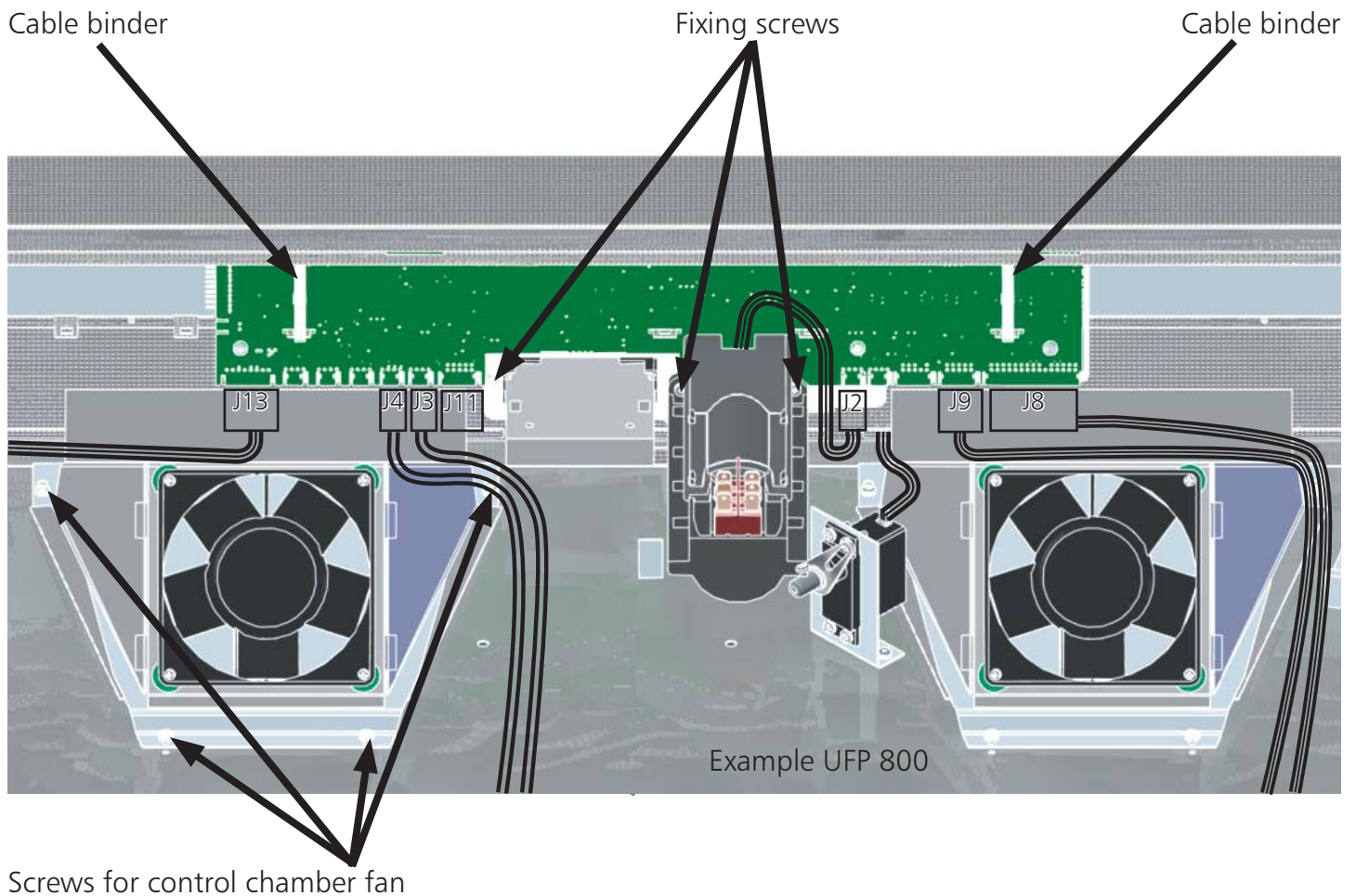
12. Replacing controller (EXCELLENT)

- Pull out the mains supply plug!
- Remove the housing cover
- Pull off the turn control knob towards the front
- On 250°C/300°C ovens (UNE, UFE, SNE, SFE) unscrew the control chamber fan
- Cut the cable binder with the side cutters and remove it
- Release the screw from the air flap spindle and remove the spindle
- Disconnect the cable (8-way) for power supply from controller location J13
- Remove connector (4-pin) for Pt100 monitor controller from controller location J3
- Remove connector (4-pin) for Pt100 working controller from controller location J4
- Remove connector (10-pin) for RS232 interface from controller location J9
- Remove connector (4-pin) for main switch from controller location J2
- Release three fixing screws (see ill.)
- Remove the controller towards the back



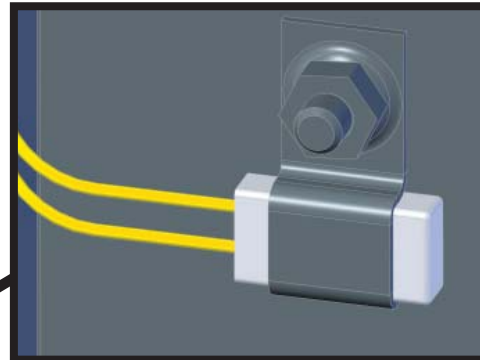
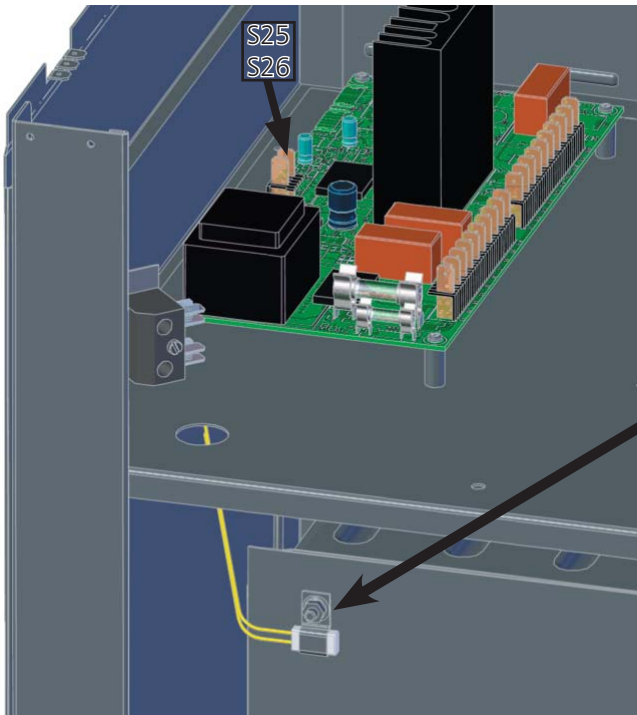
13. Replacing controller (PERFECT)

- Pull out the mains supply plug!
- Remove the housing cover
- Pull off the turn control knob towards the front
- On 250°C/300°C ovens (UNP, UFP, SNP, SFP) unscrew the control chamber fan
- Cut the cable binder with the side cutters and remove it
- Disconnect the cable (8-way) for power supply from controller location J13
- Remove connector (4-pin) for Pt100 monitor controller from controller location J3
- Remove connector (4-pin) for Pt100 working controller from controller location J4
- Remove connector (10-pin) for RS232 interface from controller location J9
- Remove connector (30/22-pin) for printer interface from controller location J8
- Remove connector (4-pin) chip card reader from controller position J11 and disengage it
- Remove connector (4-pin) air flap service from controller position J1
- Remove connector (4-pin) for main switch from controller location J2
- Release three fixing screws (see ill.)
- Remove the controller towards the back

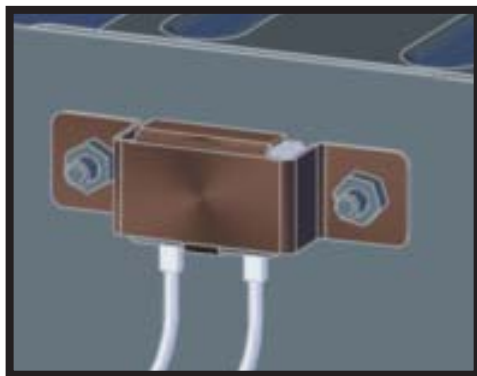


14. Replacing temperature limiter TB

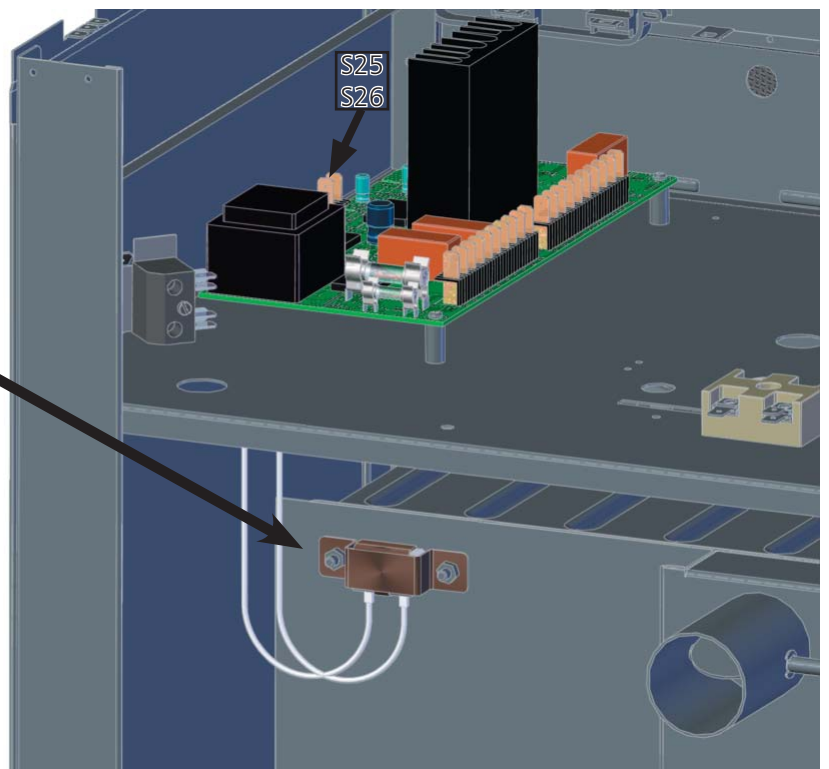
- Pull out the mains supply plug!
- Remove the housing cover
- Disconnect the earth connection on the back panel and pull out the back panel upwards.
- Expose insulation
- Unscrew mounting for TB
- Pull off temperature limiter from power unit S25 and S26 (see Section 8)



Temperature limiter
(80°C)

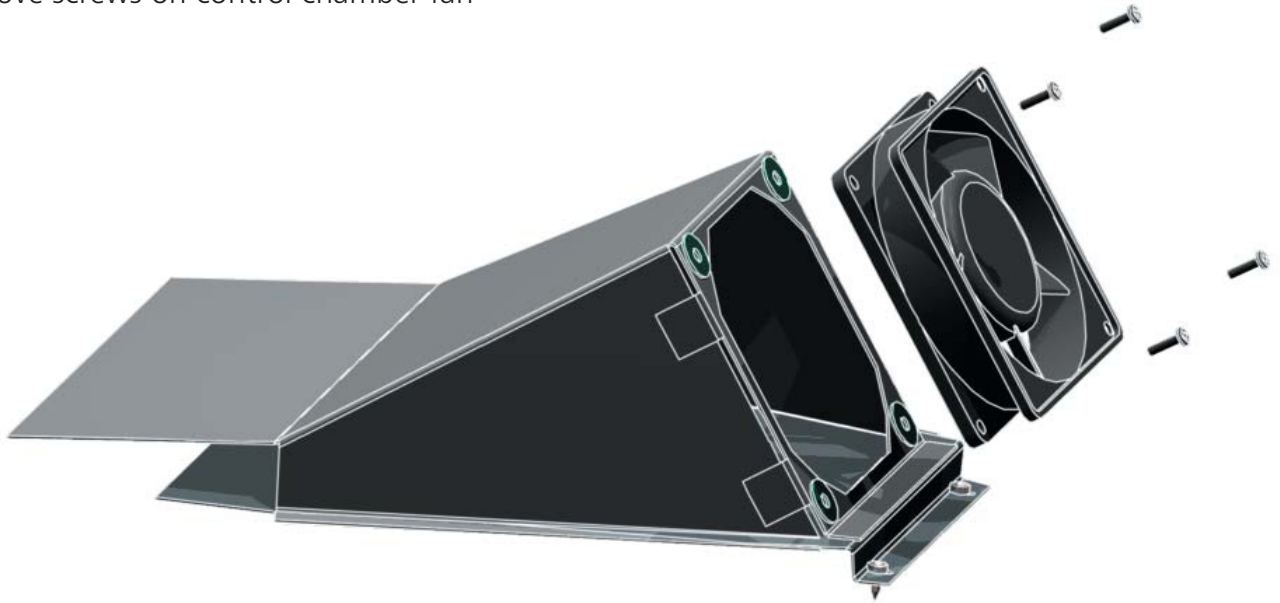


Temperature limiter
(230°C / 260°C / 320°C)



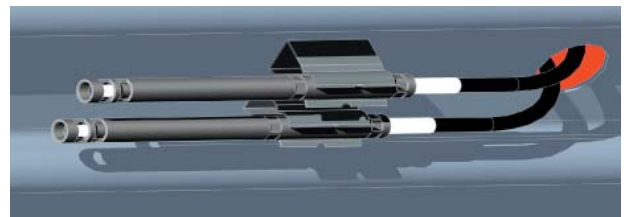
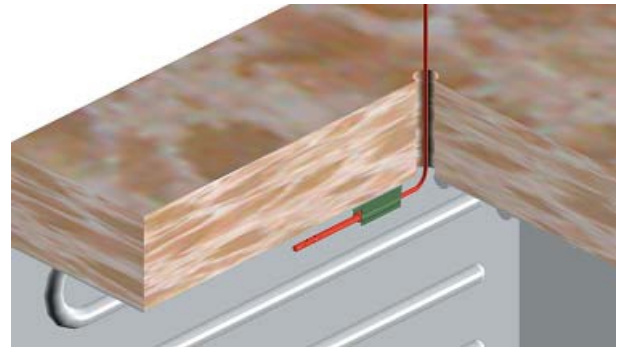
15. Replacing control chamber fan

- Pull out the mains supply plug!
- Remove the housing cover
- Pull off the chamber cabinet fan from the power unit location S30 (see Section 8)
- Remove screws on control chamber fan



16. Replacing Pt100 temperature probe

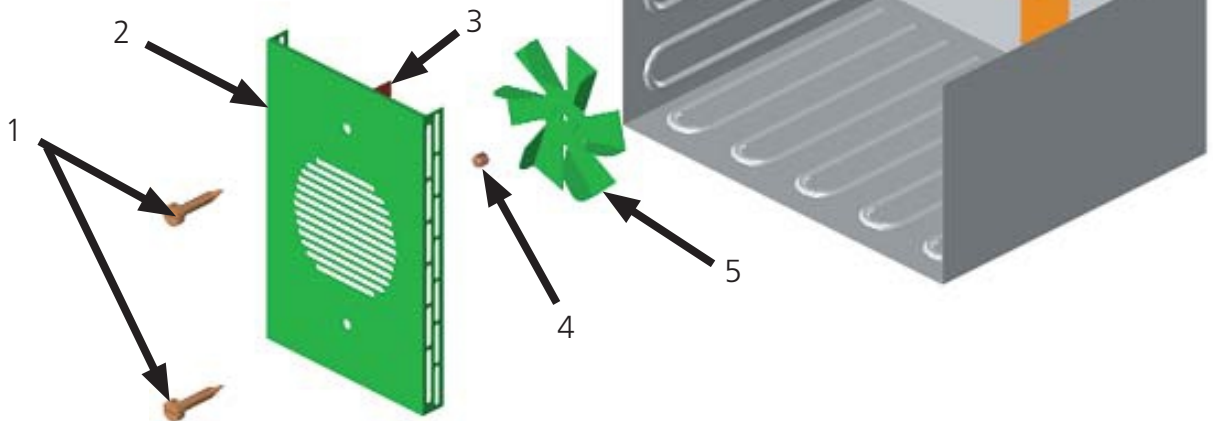
- Pull out the mains supply plug!
- Remove the housing cover
- The temperature probe can be carefully slid out of the clamp towards the back and threaded upwards through the working chamber ceiling
- Probe for working controller:
 - pull off Pt100 probe from 4-pin controller location J4 (see Section 11-13)
- Probe for monitor controller:
 - Pull of Pt 100 probe from 4-pin controller location J3 (see Section 11-13)
- Cut the cable binder with the side cutters and replace the Pt100 probe



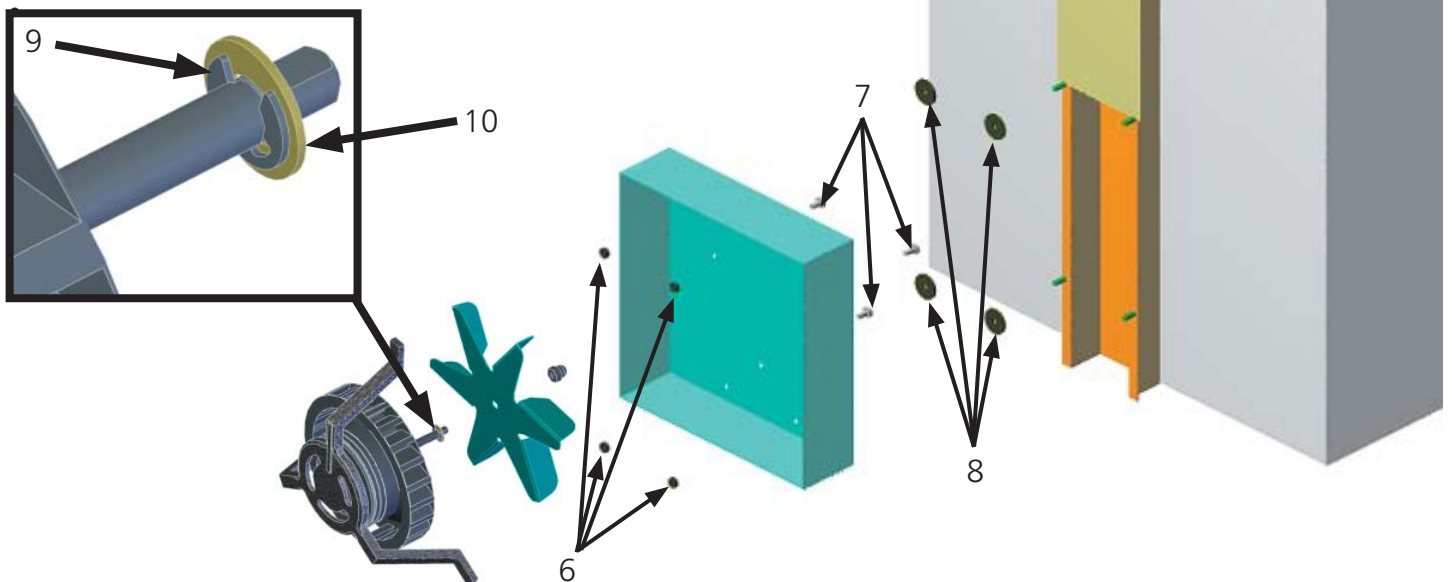
Warning!!
Ensure that the Pt100 probe is fitted correctly in its clip!
Pt100 probe must be secured level at the back in the clip.

17. Changing the circulating fan motor

- Pull out the mains supply plug!
- Remove the housing cover
- To replace the circulating fan motor it is first necessary to take off the fan duct cover (2) in the working chamber after releasing the two screws (1).
- The fan disc (5) can be pulled off after removing the cap nut (4)
(Note! left-hand thread)



- Disconnect the earth connections on the back panel and pull out the back panel upwards
- Disconnect the earth connection and cable connection from the motor at the power unit (see Section 8)
- After releasing the hexagon nuts (6) the motor baseplate has to be removed together with the fan motor.
- On the back of the motor baseplate the screws (7) can now be unscrewed and the motor pulled out.



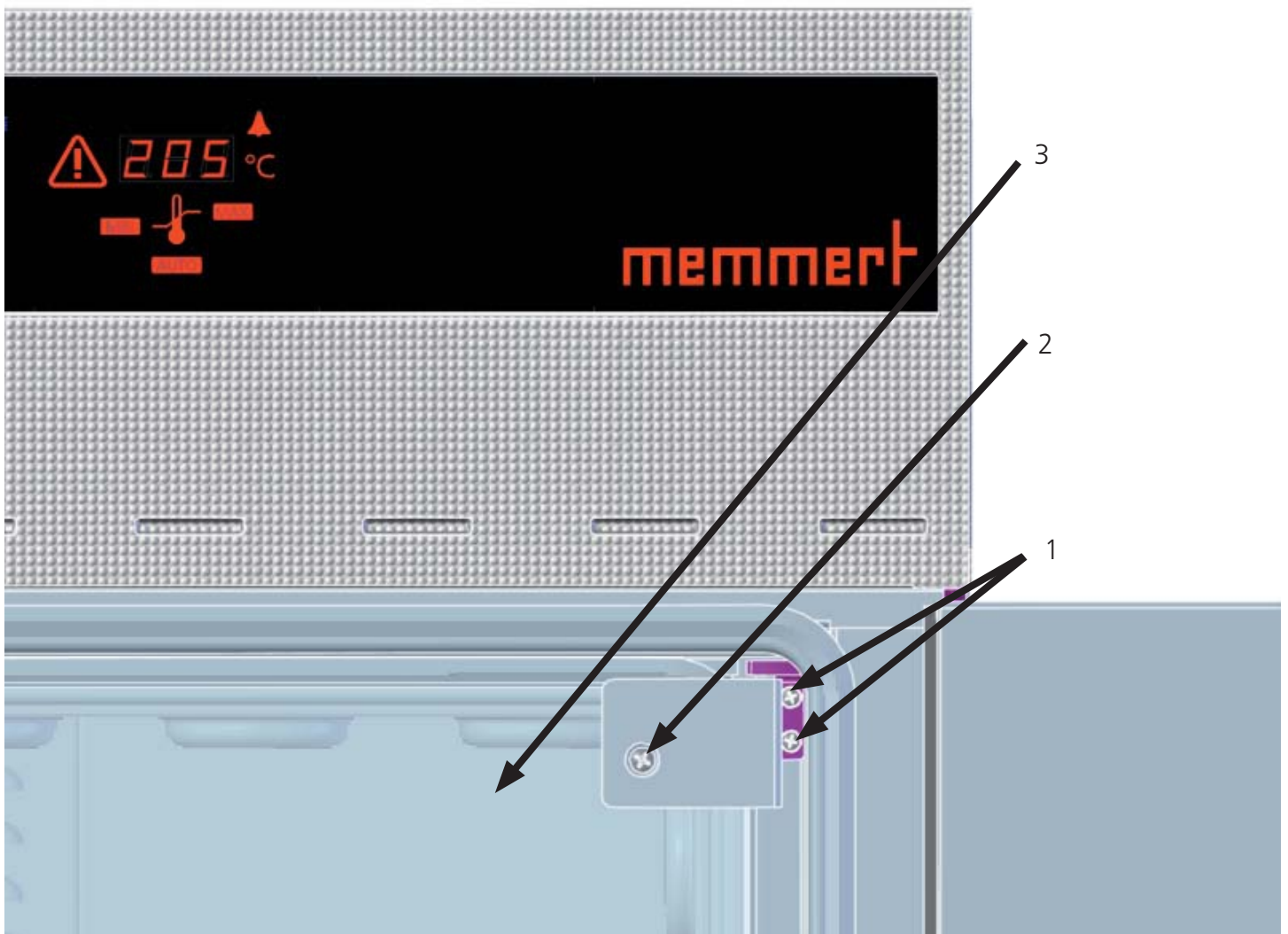
During assembly it is necessary to ensure that the spacers (8) are again positioned between motor baseplate and working chamber back wall. Ensure that the air guide (3) is directed upwards and that the lockwasher (9) and brass washer (10) are fitted as shown.

18. Adjusting and dismantling the inner door on incubators (lxx)

- Release the screws (1), do not unscrew the screws completely, otherwise the fixing block (inside) drops down.
- Adjust the inner door (3) and tighten the screws (1) again.
- Check screw (2) and tighten if necessary.

If the fixing block has dropped down, access to it is obtained by pulling out the side panel so that it can be fitted again.

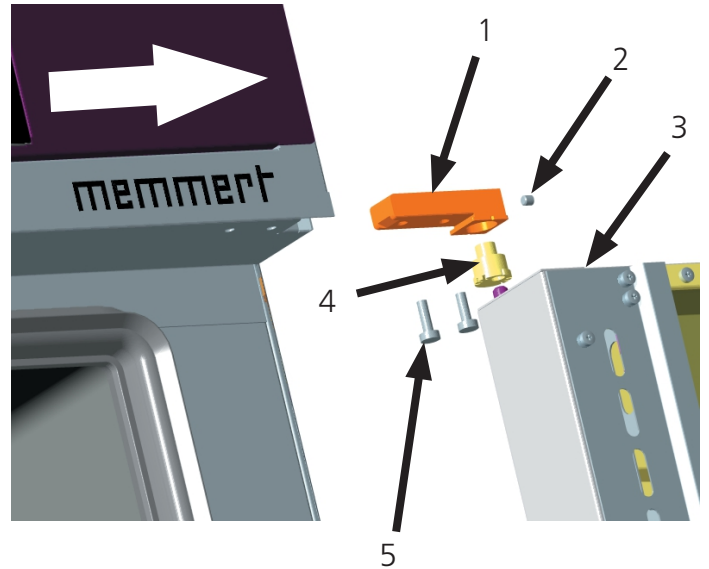
To dismantle the inner door, release the screw (2) (hold with a spanner), tilt the glass door to the front and lift it out of the bottom hinge.



19. Door – maintenance and adjustment

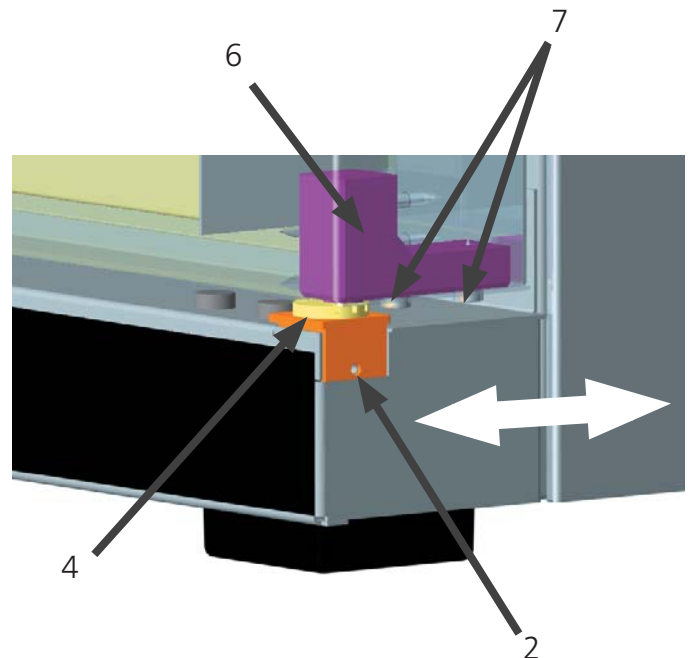
19.1. Dismantling the door

- Release the screws (5).
- Pull out the door (3) horizontally in the direction of the arrow.
- When re-fitting the door, note the following:
- Apply thin Silicone grease to the moving parts of the door hinges (see also Operating Instructions "Maintenance")
- Place a special washer at the bottom door hinge between excentric (4) and door.
- When re-fitting the door, ensure that the adjusting notch of the excentric (4) is towards the front.
- Replace the screws (5) and tighten them.

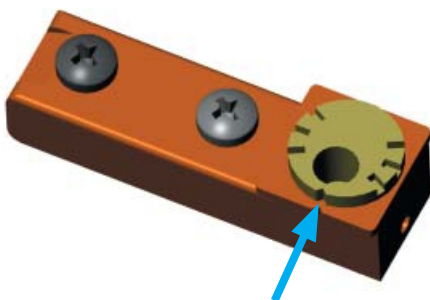


19.2. Adjusting the door

- The top part (6) of the door hinge can be moved slightly in the direction of the arrow after releasing two screws (7) on the top or bottom of the door.
- The door can be adjusted after releasing the socket screw (2) by rotating the excentric (4) with a screwdriver.
- NOTE! Screw (2) is locked with adhesive. It can be released by a sharp tug using a hexagon socket key.
- Apply fresh adhesive to screw (2) and tighten it.



Details of excentric:



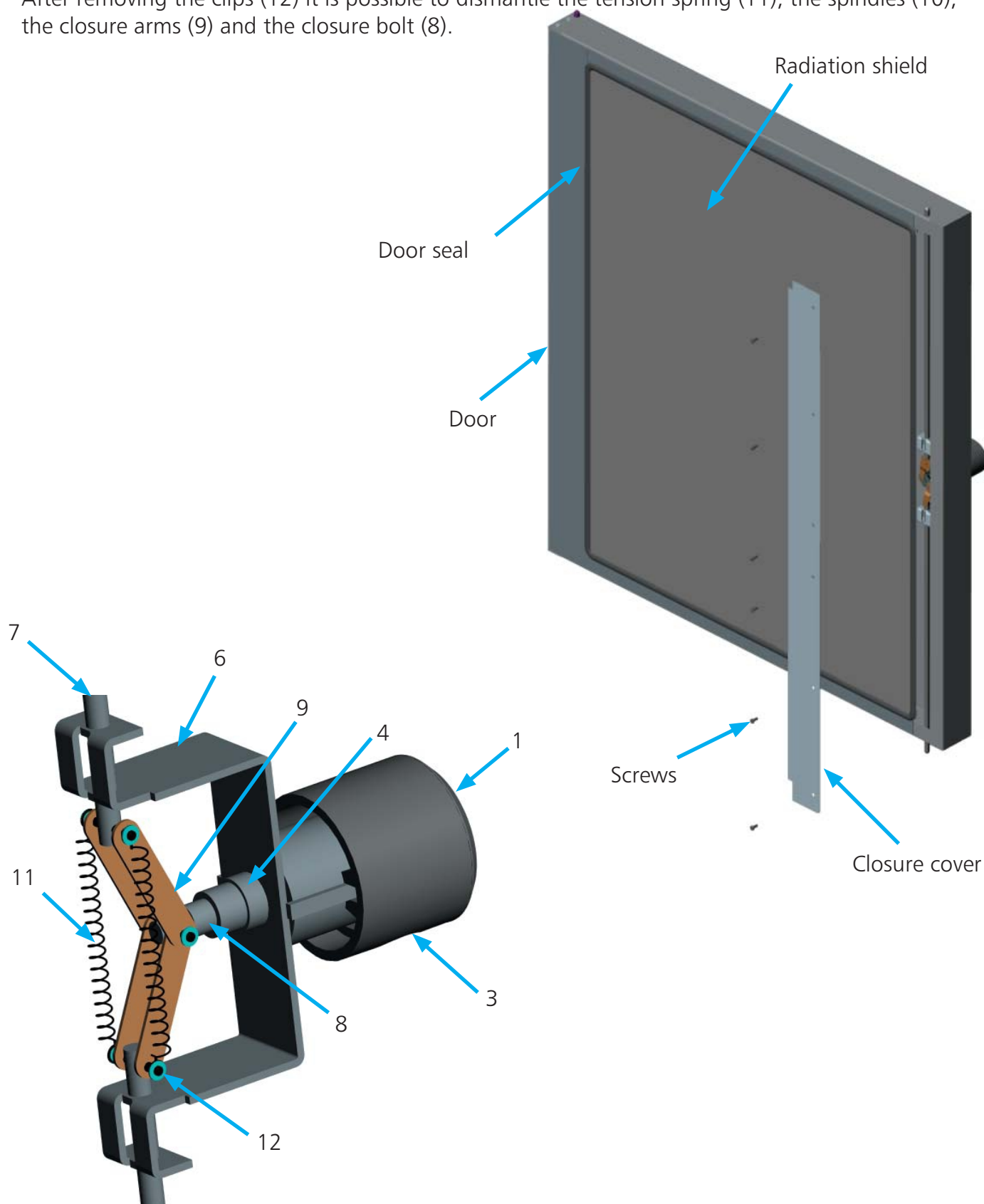
Excentric set to the front
factory-setting

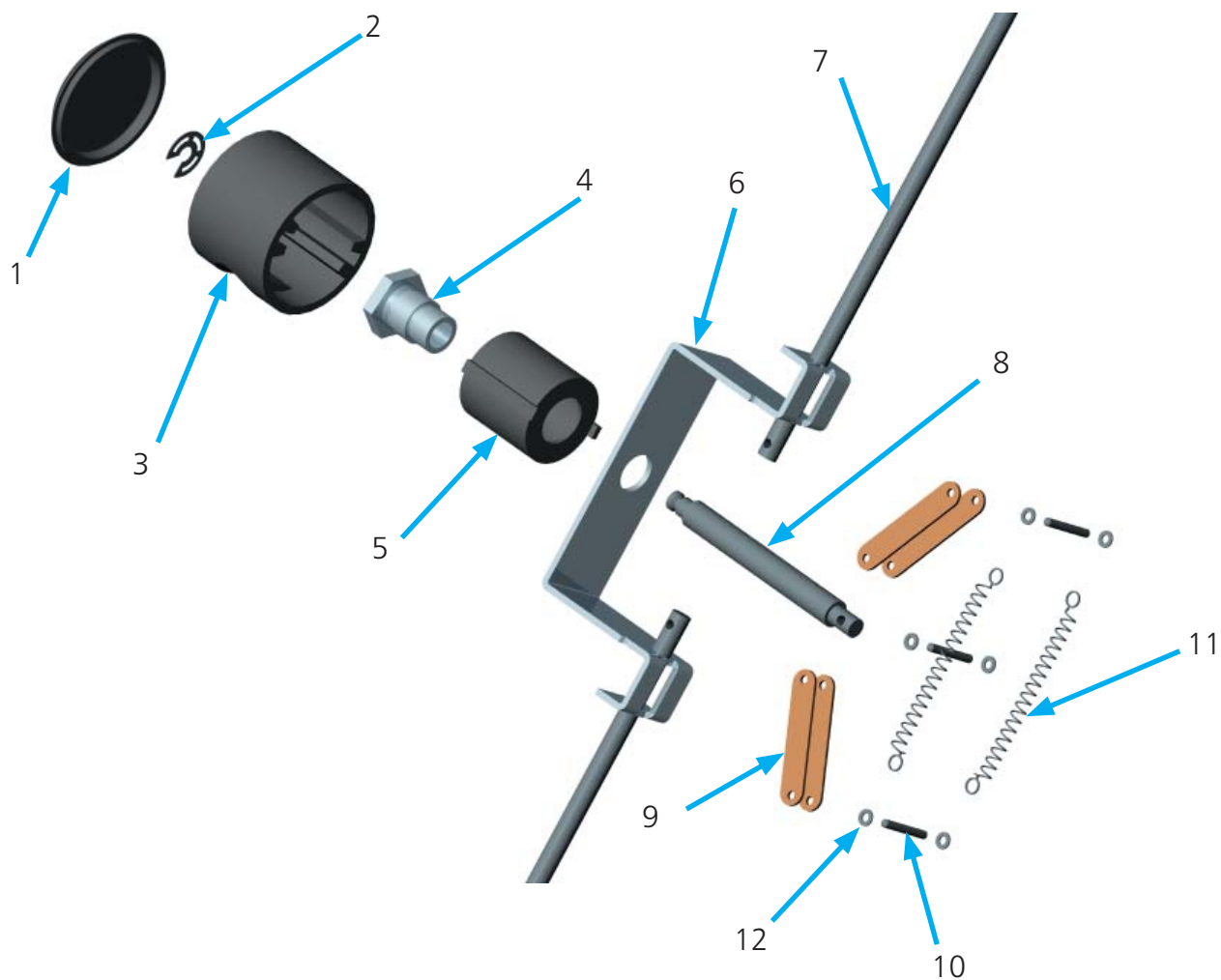


Excentric set to the right,
the door is moved to the right

19.3. Door closure – maintenance and dismantling

- Release the screws and remove the closure cover. (On Models 600-800 there is no closure cover, only unscrew and lift the radiation shield)
- On back-ventilated doors the insulation has to be removed completely and the air guides removed.
- The door closure can now be dismantled in the order 1 to 5
- After removing the clips (12) it is possible to dismantle the tension spring (11), the spindles (10), the closure arms (9) and the closure bolt (8).

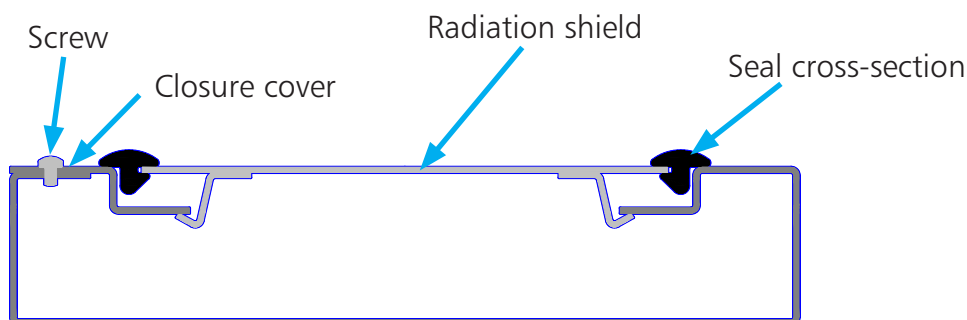




- 1 Door handle cap
- 2 Clip (large)
- 3 Door handle
- 4 Guide screw
- 5 Socket
- 6 Closure bracket
- 7 Closure rods
- 8 Closure bolt
- 9 Closure bars (brass)
- 10 Spindles
- 11 Tension spring
- 12 Clips (small)

20. Replacing the door seal

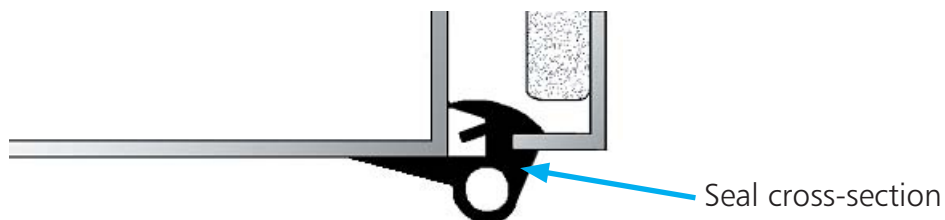
- Dismantle the closure cover (see Section 19.3)
- Raise the radiation shield and remove the old seal.
- (on Model 600-800 release the screws on the radiation shield)
- Cut the new door seal at the ends according to the old seal and slide it on the radiation shield.
- Fit the radiation shield and press it down.
- (On Model 600-800 fit the radiation shield (left with contact strip) and screw it down.)



21. Changing the working chamber seal

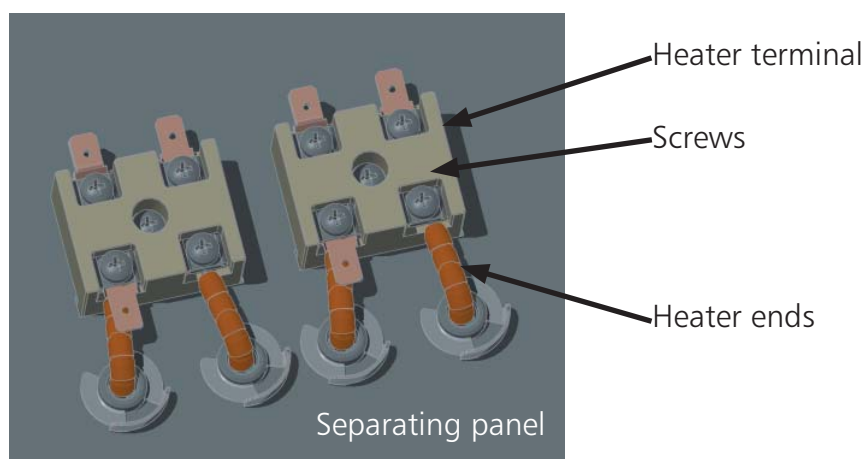
Incubators lxx have two seals

- After opening the door the seals can be pulled out and the new seal inserted.
- The pre-cut length of the seal should be pushed into the interspace without tension and can be shortened a little if necessary.



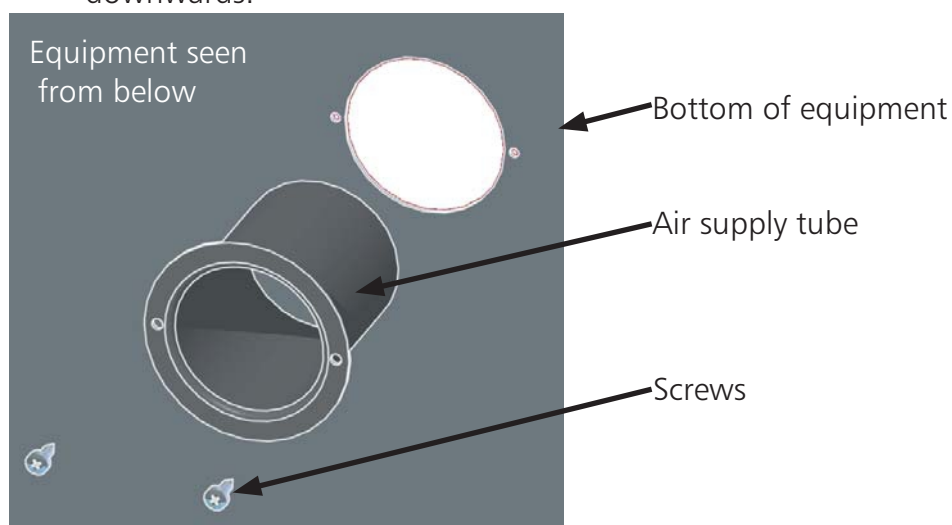
22. Replacing the heating

- Pull out the mains supply plug!
- Remove the housing cover
- Dismantle the door (see Section 19.1)
- On incubators dismantle the inner door (see Section 18)
- Take off the earth connections from the side panels and back panel.
- Pull out side panels and back panel upwards
(on Model 700/800 unscrew all screws on the back panel)
- Disconnect the adjustment spindle for the vent tube at the controller (see Section 11-13)
- Dismantle the temperature probes (see Section 16)
- Disconnect the electrical connections from the main terminals and the controller (see Section 7)
- Dismantle the main switch module (see Section 10)
- Disconnect the end of the heater from the heater terminals (and on Model 600-800 unscrew the terminal holder on the back panel of the working chamber)

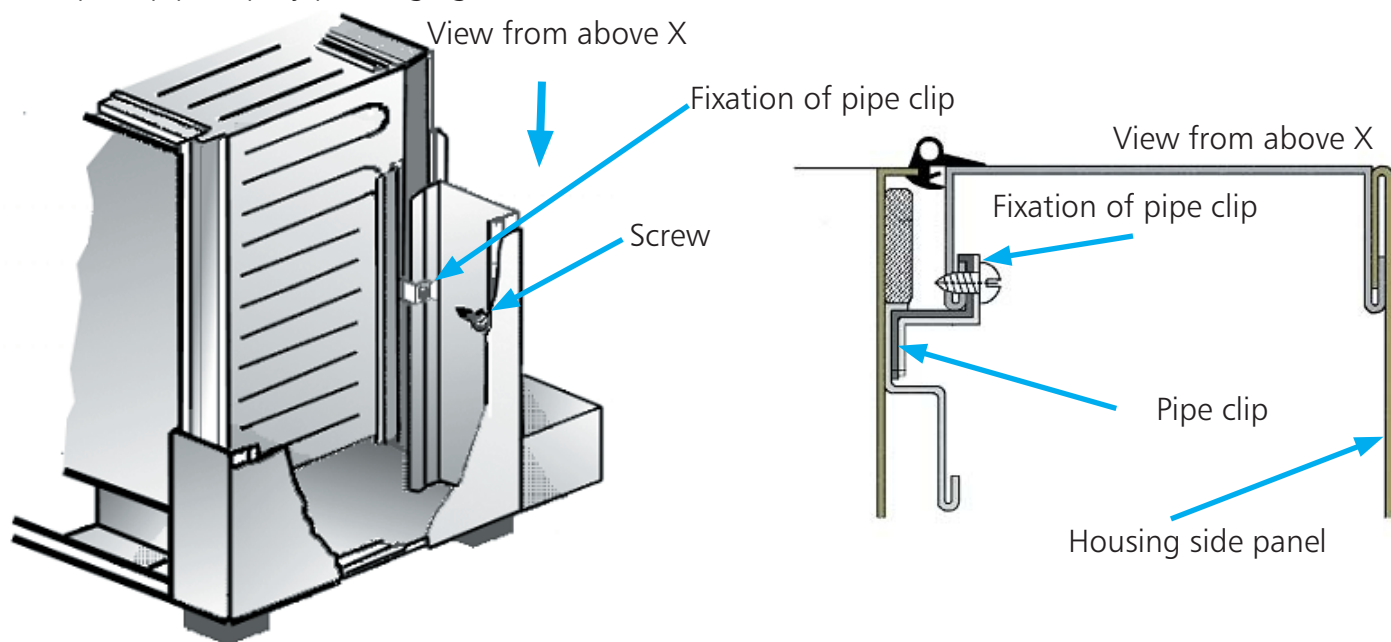


On models 100-500 the heater terminals are inside the switching chamber at the top. On Models 600-800 the heater terminals are located on the back left and right on a terminal carrier

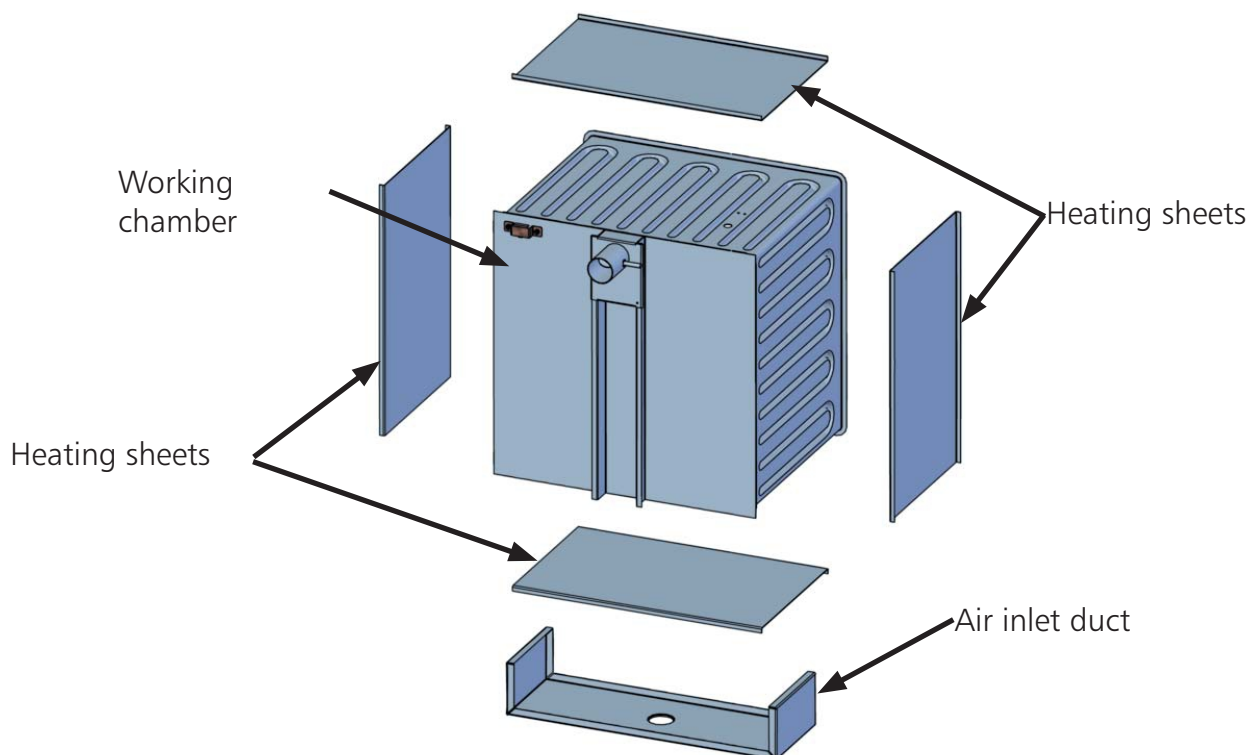
- Unscrew the separating panel
- Remove the insulating mats
- Dismantle the circulating fan motor (see Section 17)
- Release the screw for the air supply tube in the bottom of the unit and take out the air supply tube downwards.



- Pull out working chamber seal (see Section 21)
- Remove fixation of pipe clip
- Expose pipe clip by pressing against the chamber inner walls

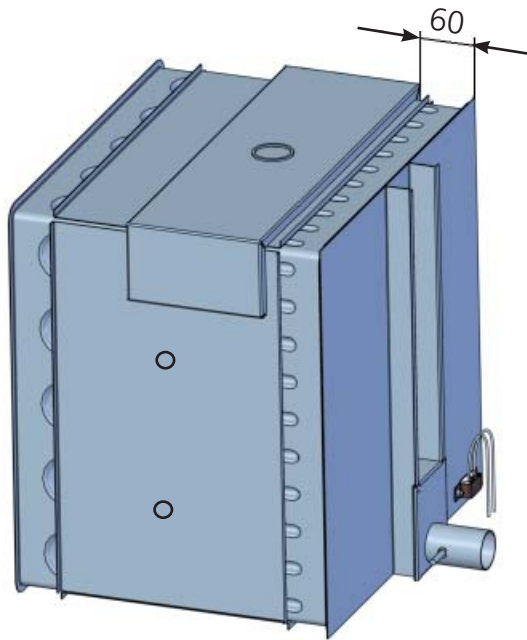


- Take working chamber out of the housing cage towards the back
- After removing the working chamber, remove foil from inlet air duct
- Dismantle inlet air duct and heating sheets by releasing the nuts, and change the heating according to the heating diagram



- Arrange the heating elements accurately – it is essential to note the length of the heater ends from the diagram!
- Secure the newly fitted heating coil with aluminium adhesive tape (supplied with the new heating elements)

- During assembly the air supply duct is affixed to the working chamber with aluminium foil and adhesive as previously. (Apply adhesive with brush on foil and air inlet duct, wait approx. one minute and then assemble the parts)
- Stick the air supply duct on the chamber with a spacing of 60 mm.
(On Model 100 the air inlet duct is affixed centrally)



- Press the foil down with a cloth and rub it firmly.
- During assembly, ensure that the pipe clips are not bent.

22. Wiring diagram

N1	Temperaturregler 55161	N1	controller module 55161
N2	Leistungsteil 55162	N2	power board 55162
N3	Leistungsteil 55162	N3	power board 55162
N4	Leistungsteil 55162	N4	power board 55162
N5	Chipkartenlesegerät	N5	chip card reader
N6	Luftklappenservo	N6	air valve servo
N7+N9	Schaltnetzteil SP200 24V / 200W	N7+N9	logical pc board SP200 24V / 200W
N8+N10	Peltiermodul mit Lüftermotoren FP 400-300: AA-081-24-12-00-ME FP 200-300: AA-084-24-12-00-ME	N8+N10	peltiermodule with fan FP 400-300: AA-081-24-12-00-ME FP 200-300: AA-084-24-12-00-ME
S1	Hauptschalter	S1	main switch
S2	mech. Temperaturbegrenzer	S2	mech. Temperature limiter
S3	mech. Temperaturbegrenzer (ICP) 135°C	S3	mech. Temperature limiter (ICP) 135°C
B1	Temperatursensor PT100	B1	temperature probe PT100
B2	Temperatursensor PT100	B2	temperature probe PT100
B3	Drucksensor 1-1100mb	B3	pressure probe 1-1100mb
B11	VO-Thermoblech mit PT100	B11	VO-thermotray with PT100
B12	VO-Thermoblech mit PT100	B12	VO-thermotray with PT100
B13	VO-Thermoblech mit PT100	B13	VO-thermotray with PT100
B14	VO-Thermoblech mit PT100	B14	VO-thermotray with PT100
X1	SUB-D 9-pol. - RS-232	X1	9 channel socket connector - RS-232
X2	SUB-D 25-pol. - Drucker	X2	25 channel socket connector - printer
X3	Buchse VO 3pol. - Pumpensteuerung	X3	3 channel socket purge funktion - pump controll
X4	Steckverteiler	X4	connectorblock
X5-6	Steckverteiler	X5-6	connectorblock
X11	Flanschdose	X11	socket for thermotray
X12	Flanschdose	X12	socket for thermotray
X13	Flanschdose	X13	socket for thermotray
X14	Flanschdose	X14	socket for thermotray
X21-26	Buchse 3pol. potentialfreier Schaltkontakt	X21-26	3 channel socket for volt free contact
M1	Umluftmotor (Modell 200-400) R2K-150 (Modell 500-800) R2E-150 (Modell 700-800) R2E-180	M1	motor for air circulation (Modell 200-400) R2K-150 (Modell 500-800) R2E-150 (Modell 700-800) R2E-180
M2	Umluftmotor R2E-180	M2	motor for air circulation R2E-180
M3+M4	Schaltraumlüfter 3414H	M3+M4	fan for cooling 3414H
K1	Schalterschütz 3TG 1010-1A/2	K1	contactor 3TG 1010-1A/2
R1-R6	Heizung	R1-R6	heating elements
Y1	Magnetventil Edelstahl	Y1	magnetic valve stainless steel
Y2	Magnetventil Messing	Y2	magnetic valve brass
Y3	Magnetventil Messing	Y3	magnetic valve brass
C1	Kondensator 6 uF	C1	capacitor 6 uF
J15	Sensorleiterplatte für Drehgeber 55161-B	J15	sensor for main switch 55161-B
H1-H2	Innenbeleuchtung	H1-H2	interior lightning
H4	Zusätzliche Hupe (option)	H4	additional buzzer (option)

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alle Modelle
Geräteliste
Wiring diagram

ab Geräte-Nr.
from no. -----

230 V / 50Hz

Schutzklasse nach
safety device according to

Zeichnungs-Nr.
plan no.
Seite 1 von 1
page 1 from 1

D09749

N1	Régulateur de température 55161	N1	Regulador de temperatura 55161
N2	Module de puissance 55162	N2	Etapa de potencia 55162
N3	Module de puissance 55162	N3	Etapa de potencia 55162
N4	Module de puissance 55162	N4	Etapa de potencia 55162
N5	Lecteur de carte à puce	N5	Aparato lector de tarjetas chip
N6	servomécanisme du clapet d'air	N6	Servo de la trampilla del aire
N7+N9	bloc secteur de commutation SP200 24V / 200W	N7+N9	Fuente de alimentación conmutable SP200 24V / 200W
N8+N10	module Peltier avec moteur de ventilation IPP 400-500: AA-081-24-12-00-ME IPP 200-300: AA-054-24-12-00-ME	N8+N10	Módulo Peltier con motores de ventilación IPP 400-500: M-061-24-12-00-ME IPP 200-300: M-064-24-12-00-ME
S1	commutateur principal	S1	Interruptor principal
S2	dispositif de sécurité mécanique TB	S2	Limitador de temperatura mec.
S3	dispositif de sécurité mécanique (ICP) 135°C	S3	Limitador de temperatura mec. (ICP) 135°C
B1	thermosonde PT100	B1	Sensor de temperatura PT100
B2	thermosonde PT100	B2	Sensor de temperatura PT100
B3	capteur de pression 1-110mb	B3	Sensor de presión 1-1100mb
B11	thermoplateau VO avec PT100	B11	Chapa térmica VO con PT100
B12	thermoplateau VO avec PT100	B12	Chapa térmica VO con PT100
B13	thermoplateau VO avec PT100	B13	Chapa térmica VO con PT100
B14	thermoplateau VO avec PT100	B14	Chapa térmica VO con PT100
X1	SUB-D 9-pol. - RS-232	X1	Conector Sub-D 9 polos - RS-232
X2	SUB-D 25-pol. - imprimante	X2	Conector Sub-D 25 polos - printer
X3	Douille VO 3pol pilotage pompe	X3	Hembrilla VO 3 polos - pump controll
X4	bloc de connexion	X4	Distribuidor enchufable
X5-6	bloc de connexion	X5-6	Distribuidor enchufable
X11	prise pour thermoplateau	X11	Caja de brida
X12	prise pour thermoplateau	X12	Caja de brida
X13	prise pour thermoplateau	X13	Caja de brida
X14	prise pour thermoplateau	X14	Caja de brida
X21-26	douille 3pol pour commutation hors potentiel	X21-26	Hembrilla 3 polos para contacto de conmutación libre de potencial
M1	moteur turbine de brassage (Modell 200-400) R2K-150 (Modell 500-800) R2E-150 (Modell 700-800) R2E-180	M1	Motor de recirculación (Modelo 200-400) R2K-150 (Modelo 500-800) R2E-150 (Modelo 700-800) R2E-180
M2	moteur turbine de brassage R2E-180	M2	Motor de recirculación R2E-180
M3+M4	ventilateur compartiment technique 3414H	M3+M4	Ventilador de la sala de conexión 3414H
K1	contacteur 3TG 1010-1A12	K1	Contacto 3TG 1010-1A12
R1-R6	éléments de chauffe	R1-R6	Radiador
Y1	électrovanne inox	Y1	Electroválvula de acero inoxidable
Y2	électrovanne laiton	Y2	Electroválvula de latón
Y3	électrovanne laiton	Y3	Electroválvula de latón
C1	condensateur 6µF	C1	Condensador 6 uF
J15	platine pour bouton rotateur 55161-B	J15	Placa de circuitos impresos del sensor para el encoder giratorio 55161-B
H1-H2	éclairage intérieur	H1-H2	Iluminación interior
H4	avertisseur additionnel (option)	H4	Bocina adicional (opcional)

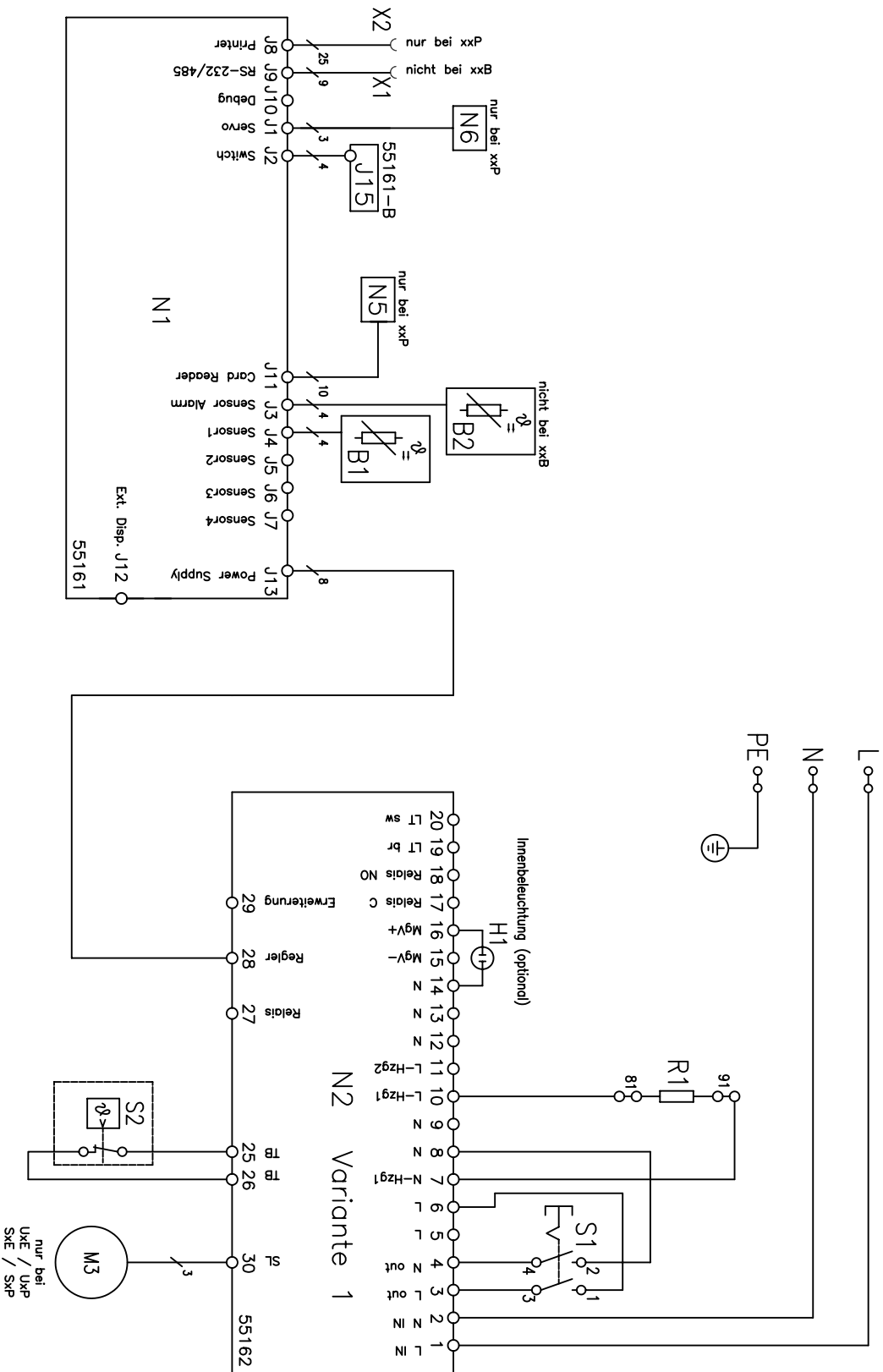
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Estado: 10.05.2005

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					Schéma n° Plan No. Page 1 de 1 Página 1 de 1
					D09757

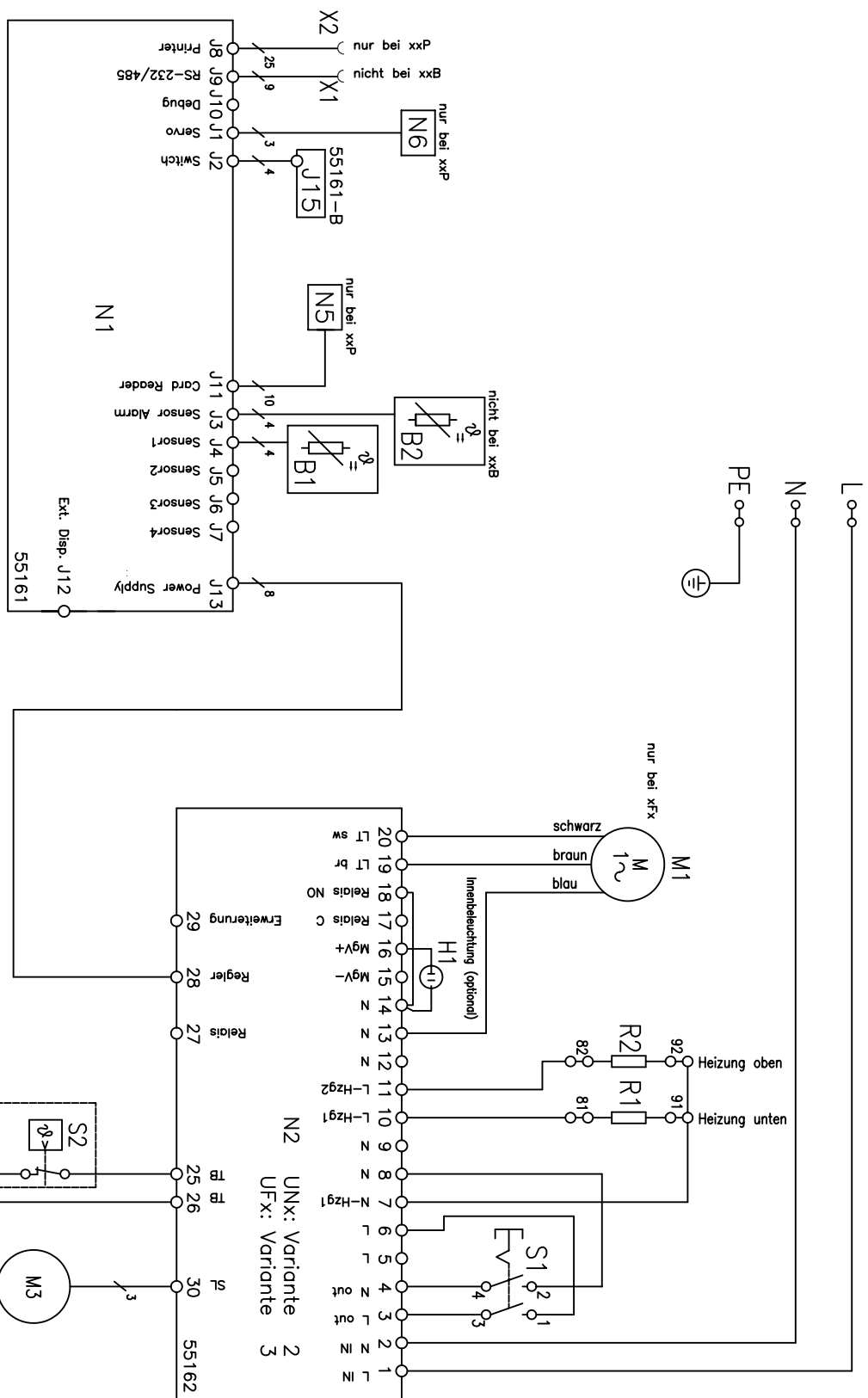
Tous modèles / all Modelo
Liste des pièces
Lista de aparatos de todos los modelos



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Stand: 23.12.2004		Name		db Geräte-Nr.	
2004	Tag	2004	Tag	230 V	50/60Hz
gez.	17.08	gez.	17.08	Schutzklasse nach safety device according to	
gepr.		gepr.		Seite 1 von 1 D09745	
Wirk Schaltplan / Wiring diagram		Universalwärmeschränke		plan no.	
Sterilisatoren		UNB UNE UNP 100-300		page 1 from 1	
Brutschränke		SNB SNE SNP 100-300			
		INB INE INP 200-400			



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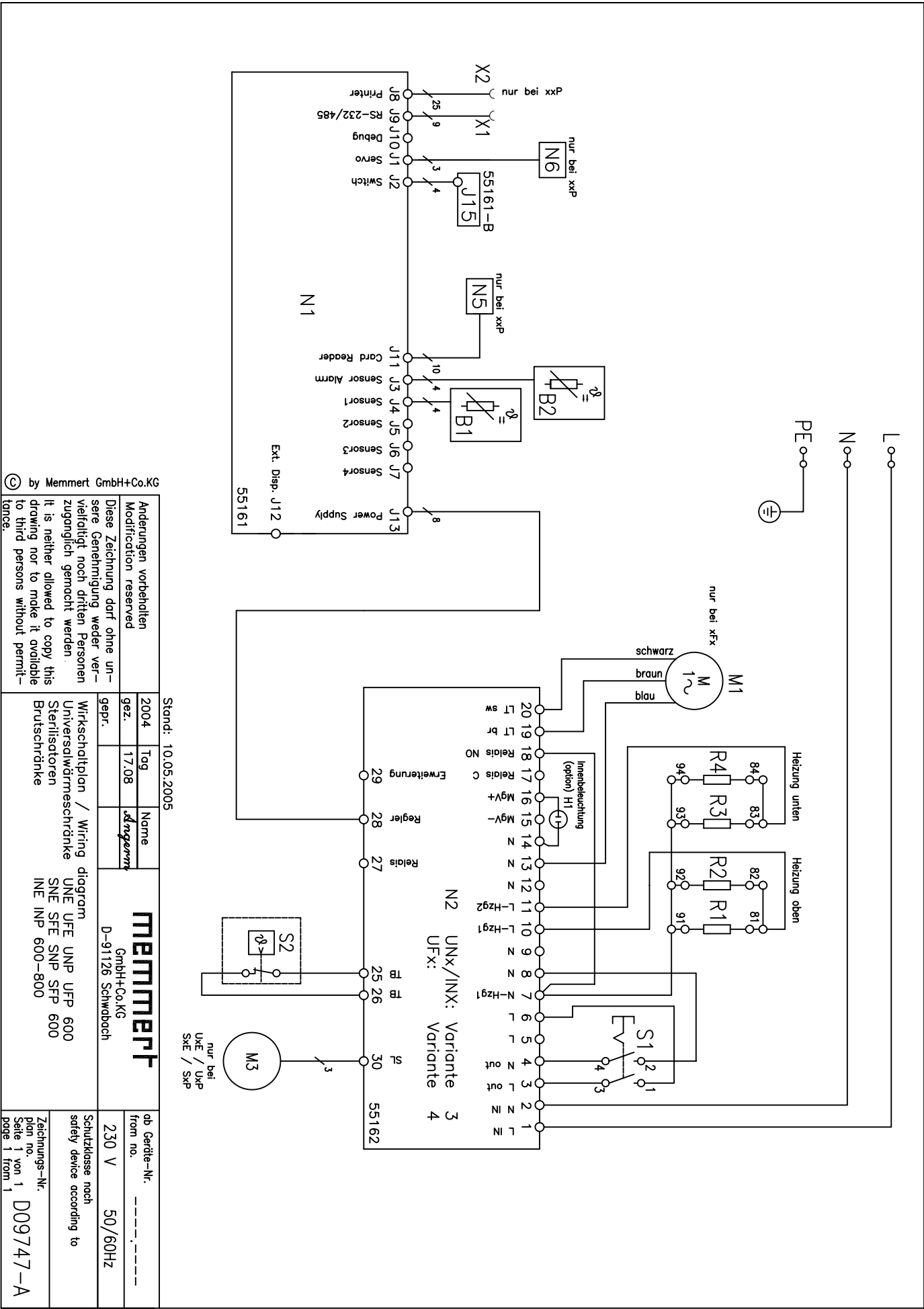
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Wirk Schaltplan / Wiring diagram
Universalschaltplan
SFB SFE SFP 400-500
INB INE INP 500

db Geräte-Nr. -----
from no. -----
230 V 50/60Hz
Schutzklasse nach
safety device according to
Zeichnungs-Nr.
plan no.
Seite 1 von 1 D09746
page 1 from 1

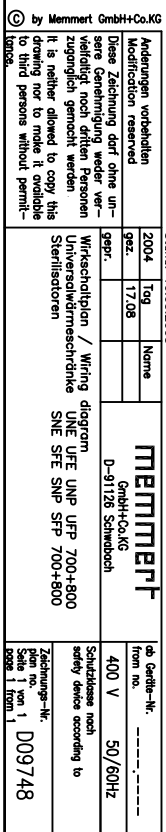


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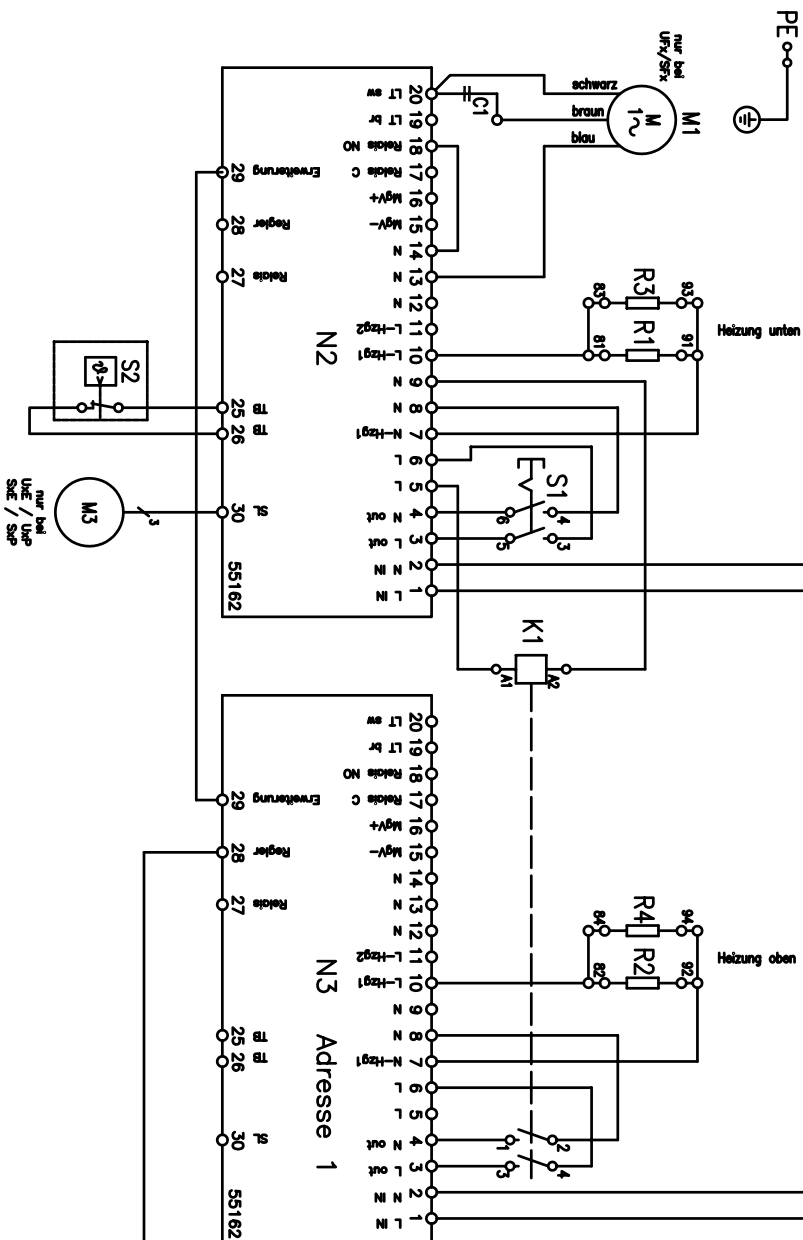
Wirk Schaltplan / Wiring diagram Universalschaltplan Sterilisatoren Brutschränke	UNE UFE UNP UFP 600 SNE SFE SNP SFP 600 INE INP 600-800
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db Geräte-Nr. from no.	230 V	50/60Hz
Schutzklasse nach safety device according to	Seite 1 von 1	D09747-A



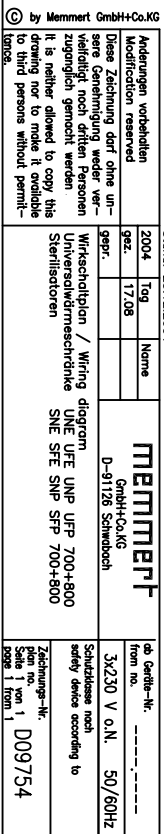
The diagram illustrates a two-zone heating control system. It features a Siemens 55162 terminal block with two main sections, N2 and N3, each with 20 pins. The wiring is as follows:

- Power Supply:** L (Line) and N (Neutral) are connected to the top of the terminal block. PE (Protective Earth) is connected to the bottom.
- Motor (M1):** A three-phase motor with terminals L1, L2, and L3. It is connected to pins 1, 2, and 3 of the N2 section. A capacitor C1 is connected between pins 1 and 2.
- Heizung unten (Bottom Heating):** A heater with terminals 81 and 82. It is connected to pins 10 and 11 of the N2 section.
- Heizung oben (Top Heating):** A heater with terminals 81 and 82. It is connected to pins 10 and 11 of the N3 section.
- Control Components:**
 - Relays:** Relays R1, R2, R3, and R4 are connected to various pins in both sections.
 - Switches:** Switches S1 and S2 are connected to pins 4, 5, and 6 in both sections.
 - Sensors:** Sensors like LT sw, LT br, and LT bz are connected to pins 17, 18, and 19 in both sections.



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24. Index

A

air flap 8
air flap servo 8
air flap spindle 8
air supply duct 24
air supply tube 23

C

chip card reader 8
circulation fan motor 17
closure arms 21
closure bracket 21
closure rods 21
control chamber 8
control chamber fan 16
controller 12
customer service 27

D

door 19
door closure 20
door seal 22

E

error messages 5
excentric 19

F

fault cause 5
fault details 5
fault finding 5
fault rectification 5
feed-through heating 8
feed-through Pt100 temperature probe 8
fuse, main oven 10
fuses 10

H

heater terminals 23
heating 23
heating sheets 24
housing cover 7

I

inner door 18

M

magnet 11
monitor display 5

P

pipe clip 24
power unit 10
Pt100 temperature probe 16

R

radiation shield 20

S

safety notes 4
service, customer 27
start-up 4
switch module, main 11

T

TB 15
temperature indication 5
temperature limiter 15
temperature probe 16
terminal 8
timer display 5
tools 6
turn control 11
turn control knob 11

W

working chamber 24
working chamber seal 22

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